Clarkson University

Undergraduate Catalog

2022-2023

CLARKSON UNIVERSITY UNDERGRADUATE CATALOG 2022-2023

School of Arts & Sciences
David D. Reh School of Business
Wallace H. Coulter School of Engineering
Interdisciplinary Programs
Institute for a Sustainable Environment
Institute for STEM Education
www.clarkson.edu
315-268-6400

Clarkson University is a nationally-ranked research university and the institution of choice for more than 3,800 enterprising, high-ability scholars from diverse backgrounds who embrace challenge and thrive in a rigorous, highly collaborative learning environment. We add value to our students' education by partnering with leading businesses, industries and thought leaders to bring relevance to the challenges and needs of a modern world in which the boundaries of knowledge, discipline, nations, and cultures blur. We encourage students to question the status quo, push the limits of what is known, and to apply their ingenuity to develop fresh solutions to real-world challenges. For more than 100 years, our graduates have achieved extraordinary professional success, risen to societal challenges, and advanced the global economy ethically and responsibly. Among our 38,000 alumni, one in five is a CEO, senior executive or owner of a company.

Founded in 1896 to honor Thomas S. Clarkson, the University's main campus is located in the "college town" of Potsdam, NY on a historic 640-acre wooded homestead in the foothills of the Adirondack Park. With three other universities nearby, Clarkson community members enjoy a constantly changing social and intellectual quality of life largely influenced by our proximity to the north slope of the Adirondacks; easy drives to Lake Placid as well as Ottawa and Montreal, Canada; and a high level of regional camaraderie to encourage innovative partnerships in small business development, arts, tourism, recreation, agriculture and green energy.

Clarkson's educational strengths include:

- rigorous professional preparation
- dynamic, real-world learning
- highly collaborative community
- teamwork that spans disciplines

Questions regarding undergraduate admission and requests for information about Clarkson may be directed to the Office of Undergraduate Admissions.

Changes in Curricula

Information contained in this catalog is current at the time the catalog is posted on our Web site, but as courses and curricula undergo changes by official action of the University, occasionally such changes may supersede information found herein. The accuracy of any particular information can be checked through the Office of Undergraduate Admission, Student Administrative Services, the Dean of the appropriate School, or academic departments.

Please be aware that the information concerning academic requirements, courses, and programs of study in the catalog does not establish an irrevocable contract between the student and the University. The University can change, discontinue, or add academic requirements, courses, and programs of study at any time, without notice. Although every effort is made to provide timely notice to students in order to help in the planning process, it is the responsibility of the student to confirm that all appropriate degree requirements are met.

All students are encouraged to read the catalog thoroughly. Failure to be familiar with the contents does not excuse a student from the requirements and regulations described herein.

Courses

Typical courses for each department are listed in this catalog, but not all courses are offered each year. Descriptions of courses and terms in which specific course are offered are accessible in myCU. Viewing Clarkson's searchable course catalog will give up-to-date course descriptions, pre- or co-requisites, course attributes, and other information pertaining to all courses offered. Clarkson's browse course catalog can be viewed at www.clarkson.edu. There is no log-in required - just select the term and year that you are interested in viewing.

Course credit is also available for Independent Study and Special Projects.

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THE CLARKSON EDUCATION

Clarkson academic programs span boundaries and vary widely in content. However, at the heart of the institution's educational process are fundamental goals and values that define a common learning experience and shape the growth of every Clarkson student. The University has articulated its mission, vision, and values as follows:

Mission of Clarkson University

Clarkson University is an independent, nationally recognized technological university whose faculty of teacher/scholars aspires to offer superior instruction and engage in high-quality research and scholarship in engineering, business, science, health, education and liberal arts. Our primary mission is to educate talented and motivated men and women to become successful professionals through quality pre-collegiate, undergraduate, graduate, and professional continuing education programs, with particular emphasis on the undergraduate experience. Our community and campus settings enhance the quality of student life and afford students access to and interaction with their faculty. We value the diversity of our University community, and we strive to attune ourselves and our programs to our global, pluralistic society. We share the belief that humane and environmentally sound economic and social development derive from the expansion, diffusion, and application of knowledge.

Vision of a Clarkson Education

The Clarkson University educational experience is designed to provide talented and ambitious students with the knowledge and skills necessary to achieve positions of leadership within their chosen profession. The combination of Clarkson's strong technologically rich curricula and State-of-the-art teaching and research facilities, coupled with an unparalleled commitment to a friendly learning environment and to students' personal development, uniquely prepares Clarkson graduates to excel in their chosen professions and to lead rewarding and creative lives.

In addition to attaining mastery of the core knowledge within his or her field, a Clarkson education is designed to enable students to:

1. Solve real-world, open-ended problems with creativity and risk taking to obtain solutions that are practical and sustainable, including those they encounter in state-of-the-art research under the direction of distinguished faculty;
2. Develop and refine exceptional communication skills with an awareness of potential cultural differences;
3. Lead effectively and work productively within disciplinary and multidisciplinary teams composed of members with diverse interests and backgrounds;
4. Excel in using computing and information technologies;
5. Learn through instruction and guidance by nationally recognized faculty whose commitment to both teaching and research has made Clarkson a nationally ranked university.

A Clarkson student's education is greatly enhanced by a personal and friendly learning environment, within a small, residential, nationally recognized University, which:

1. Places students at the center of the educational process and where all employees have a commitment to creating an environment that contributes positively to students' overall educational experience;
2. Draws undergraduates, graduate students, faculty and staff together into a cohesive and stimulating learning community, wherein an atmosphere of scholarship and spirit of research is cultivated;
3. Use our campus as a living laboratory to improve learning, and uses the wider region to broaden and extend Clarkson's outreach and service;
4. Provides personal advising and interaction with faculty and staff as well as supportive relationships among students;
5. Offers many leadership opportunities through co-curricular groups and activities;
6. Respects and learns from its community of diverse people, backgrounds, and cultures.

Together, these provide a unique educational experience that is directed toward developing the whole person.

Major Values of the Clarkson Community

"Lead by Example and Others Will Follow"

Caring : A positive and friendly atmosphere is created when we care about each other, when we are open to constructive criticism, and when we show appreciation for a job well done.
Diligence: "A workman that needeth not to be ashamed." Initiative and hard work are key ingredients in getting the task done.
Diversity: The mutual appreciation of differences and a plurality of opinions, beliefs, and cultural traditions inform and enrich our lives.
Integrity: Honesty and accountability in one's actions and words form the foundation of our relationships with others.
Growth: Educational experiences in and out of the classroom enliven our minds, broaden our horizons, and facilitate dialogue and consensus. Learning is a lifelong activity.
Service : Offering our time and skills for the good of our fellow citizens leads to the prosperity and environmental health of the community and to the well-being and character development of the individual.
Teamwork: Effective teamwork encourages creativity and self-initiative in our respective roles and partnerships. It is essential in getting the task done and in developing the skills needed to meet the challenges of ensuring sustainability of local and global economic, environmental and social systems.
Vision : Having a vision of a sustainable future helps us prepare for it. Embracing the inevitable changes in our world as opportunities allow us to anticipate, promote, and facilitate change.

ABOUT CLARKSON UNIVERSITY

Clarkson is a private, national research university and proven leader in technological education and sustainable economic development. Through more than 95 rigorous programs of study in engineering, business, arts, education, sciences and health professions, we educate 4,300+ students and pursue interdisciplinary research, scholarship and innovation. We ignite connections across disciplines, industries and social cultures to create the entrepreneurial mindset, knowledge and intellectual curiosity needed to innovate world-relevant solutions and prepare the leaders of tomorrow. Alumni earn salaries that are among the top two percent in the nation and realize accelerated career growth. Founded in 1896, Clarkson's main campus is located in Potsdam, New York, and additional graduate programs, online networks and research facilities are based near industry partners in Saranac Lake, Schenectady, Beacon and New York City.

Founded in 1896 with a compelling charge to always search out the real needs of the American people, Clarkson cultivates an innovative and interdisciplinary research environment focused on rapidly solving real world problems for a better future. Example signature areas of research include STEM and entrepreneurial education, healthy global solutions, computational and data-enabled discovery, advanced materials development, and next generation medicine and healthcare. Our external network has more than 380 active partners in industry, government agencies, chambers of commerce and research organizations affording students access to world relevant problems to pursue with their professors as well as a direct pipeline to internships and careers after graduation. In addition to an engaged 43,000+ strong alumni community in 87 countries, our global reach extends through our schools, ROTC command, research centers and institutes across the Clarkson corridor stretching from Potsdam to New York City as well as more than 40 international university exchange partners.

Here is a sample of the external accolades:

1. Clarkson alumni salaries rank in the top 2 percent of highest salaries in the United States, Pay-scale College Salary Report.
2. Colleges That Pay You Back: The 200 Schools That Give You the Best Bang for Your Tuition Buck, Princeton Review
3. One of the 25 Colleges with the Highest-Paid Graduates, Money & Career Cheat Sheet.
4. Top-tier National University, U.S. News & World Report, America's Best Colleges.
5. Top-20 Best Values (Great Schools, Great Prices), U.S. News & World Report, America's Best Colleges.
6. Best Colleges for Veterans, U.S. News & World Report, America's Best Colleges.
7. Top 10: Universities that increase salaries the most, A Clarkson degree will increase your earnings by 42 percent on average, Brookings Institution.

Clarkson's major organizational units are the School of Arts & Sciences, the David D. Reh School of Business, the Wallace H. Coulter School of Engineering, Earl R. and Barbara D. Lewis School of Health Sciences the Institute for a Sustainable Environment, the Graduate School, the Institute for STEM Education, Sponsored Research Services, and The Clarkson School, a unique program in which talented high school age students can begin college early.

Wallace H. Coulter School of Engineering
Representing approximately 54% of all student enrollment (1,656 undergraduates and 220 graduate students), the Wallace H. Coulter School of Engineering has 96 faculty and staff in the Departments of Chemical & Biomolecular Engineering, Civil & Environmental Engineering, Electrical and Computer Engineering, and Mechanical & Aeronautical Engineering. Faculty and students also participate in the engineering & management, software engineering and undergraduate interdisciplinary minors.

In spring 2002, Clarkson announced that the Wallace H. Coulter Foundation had made a $30 million philanthropic gift to the University to support the ongoing excellence in its engineering and science programs. The gift honors the late Wallace H. Coulter, a past trustee and research partner of the University, and reinforces a theme he embraced, "Technology Serving Humanity."

The School of Arts & Sciences
The School of Arts & Sciences provides the foundation for all of Clarkson's degree programs and offers distinctive majors and minors that set students apart in the competitive marketplace. The School of Arts & Sciences ignites the foundation for all of Clarkson's degree programs and offers distinctive undergraduate and graduate programs that can set students apart in the competitive marketplace. Some programs are in traditional disciplinary areas, such as biology, chemistry, mathematics, history and psychology, while others, such as biomolecular science and digital arts & sciences, integrate knowledge from several disciplinary areas to address recently emerging issues. All benefit from Clarkson's strengths in engineering and business, and all are focused on preparing students for graduate school, professional programs and careers.

The Reh School of Business
Named in 2017 for David D. Reh '62, H'17, the mission of the Reh School of Business is to combine scholarly research and teaching to create and advance knowledge at the intersection of business, technology and society. With 68 faculty and staff supporting 578 undergraduates and 251 graduate students, the Reh School focuses on areas that span traditional boundaries: global supply chain management, innovation & entrepreneurship, financial information & analysis, business intelligence & data analytics, and mathematical economics. The engineering & management program, which is among a limited number of programs in the world that enjoys dual accreditation by both engineering and business agencies, is also administered from the Reh School with close alignment to the Coulter School. All Reh students start their own

business as first-year students, engage in an international experience and develop expertise in traditional business disciplines – accounting, economics, finance, marketing, management, operations and data analytics – and then clearly see how they fit together.

The Lewis School of Health Sciences

Through a transformational gift in 2019 from Earl and Barbara Lewis, Clarkson University is establishing the Earl R. and Barbara D. Lewis School of Health Sciences for its growing portfolio of programs to assure the highest quality education for its students and advance careers, research and innovation with emphasis on meeting rural and distance-challenged healthcare needs. The Lewis School of Health Sciences currently consists of three fully accredited graduate-level programs: physical therapy, physician assistant and occupational therapy. The Lewis School consists of six to 10 faculty per program, 30 students per program cohort and approximately 225 students within the School. The occupational therapy program offers a Master of Science in Occupational Therapy, the physician assistant program offers a Master of Science in Physician Assistant Studies and the physical therapy program offers the Doctor of Physical Therapy degree.

The Clarkson Institute for a Sustainable Environment (ISE)

The ISE facilitates boundary-spanning environmental research, educational activities and external partnerships. Students from across campus can integrate sustainability into their curricular or co-curricular education by adding minors, writing proposals to implement sustainability projects on campus, participating in research or spending a semester immersed in social, environmental and economic issues as a part of the Adirondack Semester. The ISE also houses the Center for Sustainable Energy Systems (CSES), which generates new concepts and solutions in bioenergy, energy education, energy efficiency, energy literacy, environmental impact studies, energy harvesting and storage, energy policy, power systems, solar energy, transportation systems and wind energy. The Institute also supports Clarkson's significant resources focused on the management of pollution and the measuring of contaminant concentrations in environmental media. This includes the Center for Air Resources Engineering & Sciences (CARES), which brings together expertise focused on environmental sampling and analysis, receptor modeling, analytical chemistry, atmospheric deposition and the application of experimental and computational fluid dynamics to pollution problems.

The Beacon Institute for Rivers and Estuaries

As a close partner to ISE, the Beacon Institute for Rivers and Estuaries ignites citizen science, user-inspired R&D and education through collaboration and creative innovation to inspire sustainable solutions for estuary and freshwater ecosystems throughout the Hudson Valley and across New York State.

Clarkson's Institute for STEM Education
Clarkson's Institute for STEM Education also spans boundaries across the other two institutes and the schools through formal and informal educational outreach, educational and pedagogical research, and the scholarship of teaching and learning, as well as through the recruitment and retention — and persistence — of STEM students and collaboration with educational and basic-research initiatives. The institute supports a nationally recognized training program for STEM graduate students to prepare for teaching and advising roles, delivers multiple STEM enrichment programs for K12 students and teachers across the state, and offers Clarkson faculty and community members opportunities to connect, reflect, and focus on their teaching practices and student experiences.

The Honors Program
The Honors Program is a small community of about 187 students. Students in the Honors Program are diverse, nationally and ethnically, with about equal numbers of women and men and representing all majors at Clarkson. Founded in 1997, the Honors Program takes the undergraduate experience to an entirely new level. Clarkson is famous for its hands-on, problem-based curriculum, but the Honors Program provides even more opportunities to conduct original research or independent projects; experience internships, co-ops or study abroad placements; and work in teams on real-world problems. Admission to the Honors Program is highly selective. Honors students form an intimate, supportive, highly motivated and talented "community within a community."

Closely aligned to the Honors Program, **The Clarkson School** is a selective early-college academy that engages approximately 60 talented and motivated high school students who enroll as first-year university students at Clarkson. Taking the same courses as undergraduates and accessing all the same support services, clubs and activities, "Schoolies" live in a special living-learning community that provides additional support for personal growth, academic achievement and professional development.

Centers
Several academic research centers further leverage the University's scholarly strengths. For example, the **Center for Advanced Materials Processing (CAMP),** which is also a New York State Center for Advanced Technology, contains state-of-the-art research laboratories that enable faculty to pursue cutting-edge research and are accessible to undergraduates and graduate students for collaborative projects.

In March 2019, New York State designated Clarkson University and SUNY College of Environmental Science & Forestry (ESF) to co-lead a new **Center of Excellence (CoE) in Healthy Water Solutions** to deliver synergistic problem-solving on the wide-range of water issues impacting the Empire State. Clarkson's world-class technical and engineering innovation expertise in healthy water systems and ESF's renowned expertise in monitoring, watershed ecosystem management and solution development

uniquely position the CoE to create and leverage partnerships across the public-private sectors.

The **Center for Electric Power System Research** mission is to foster research collaborations across the university, and to grow our power systems research capability. The Center goal is to work closely with industry, and the Industry Advisory Board has an important role in the Center governance.

The **Center for Rehabilitation Engineering, Science and Technology (CREST)** serves to integrate biomedical engineering and science with assistive and adaptive technologies and physical therapy to improve lives affected by disease or injury.

As a National Science Foundation Industry-University Cooperative Research Center, the **Center for Identification Technology Research (CITeR)** serves its affiliates in the rapidly growing areas of biometric identification and credibility assessment technology through an interdisciplinary group of faculty, researchers and students.

The **Clarkson Center for Complex Systems Science (C3S2)** addresses the rapidly growing field of identifying and understanding causality in large-scale systems, as well as the hierarchical interactions, patterns and scaling of system components across a variety of fields, such as brain science, insect swarming, social science and fluid dynamics.

Clarkson University has significant resources in people and equipment that focus on the management of air, water and soil pollution. **The Center for Air and Aquatic Resources Engineering and Sciences (CAARES)** is the center that brings together this world-class expertise.

The **Center for Metamaterials (CfM)** is an NSF-sponsored Industry/University Cooperative Research Center. The CfM's mission is to provide a collaborative, multi-university one-stop shop to research, design, fabricate and test a wide range of metamaterials, photonic crystals, and plasmonic structures

Clarkson is also the home of military science programs for the 135 cadets in the Golden Knights Battalion in the **U.S. Army and Air Force ROTC** programs. Students from St. Lawrence University, SUNY Potsdam, SUNY Canton and Paul Smith's College are also eligible to participate in ROTC through Clarkson. Students with strong academic backgrounds — who are physically fit and have active minds and the ability to rapidly assimilate information — thrive before becoming active duty officers with choice assignments in the United States military.

Clarkson's Engineering & Management program is the second program in the world to be accredited by both **AACSB International and the Engineering Accreditation Commission of ABET.**

Collaborative projects to solve real-world problems prepare students in all majors for the team-oriented global workplace. Some 400 undergraduates a year perform faculty-mentored research or participate in national academic team competitions through Clarkson's award-winning program called SPEED (Student Projects for Engineering Experience and Design). Competition projects range from environmental problem solving to Mini-Baja vehicle racing to FIRST Robotics.

All business students work on entrepreneurial teams that create and run actual companies. There are more than 50 study abroad programs in 28 countries, as well as internships, workplace co-ops, and research fellowships, which broaden the undergraduate educational experience.

Clarkson's physical facilities are valued at $269.4 million. They comprise approximately 1,324,053 square feet of assignable space, of which almost 90 percent has been built since 1970. More than 339,410 sq. ft. are dedicated exclusively to academic programs, including 51,559 sq. ft. in traditional classrooms and 162,941 sq. ft. assigned in laboratory areas.

Retention studies of independent institutions in New York State show on average that 69.7 percent of students who enter as freshmen complete their degrees within six years, and 57.4 percent in four years. At these same schools, the sampling of transfer students shows 64.6 percent completing their degrees in four years and 69.0 percent in six years.

At Clarkson the graduation rate is well above the norm: averaged among those completing degrees over the past three years, 78.0 percent of freshmen completed their studies for a bachelor's degree within six years; 77.1 percent in five years; and 64.6 percent in four years or less. *Among transfer students, 47.9 percent complete their bachelor's degrees in two years and 84.0 percent in four years.

*Under the Student Right to Know Act, the federal government requires the University to publish the six-year graduation rate for students who have enrolled as first-time freshmen. Clarkson operates a unique program known as The Clarkson School, which allows students to begin their college career one year early (see Undergraduate Admission). This program attracts some students who may not intend to remain at Clarkson for four years and inclusion of these students in the total has the effect of making that published rate misleading. The inclusion of Clarkson School students makes the University's six-year graduation rate 76.3 percent.

A BRIEF HISTORY OF CLARKSON

(The following summary has been excerpted largely from *A Clarkson Mosaic,* a history written by Professor Emeritus Bradford B. Broughton in conjunction with the institution's 1996 Centennial.)

Two months after a highly successful Potsdam businessman, Thomas Streatfeild Clarkson, was crushed to death while trying to save one of his workers in his sandstone quarry on August 17, 1894, his family began planning a memorial to him: a school.

Choosing as their rationale a phrase which his sisters and nieces felt aptly described their brother- Thomas' favorite Biblical quotation, A workman that needeth not to be ashamed- the family opened the Thomas S. Clarkson Memorial School of Technology in September 1896, in the Main Building ("Old Main") which they commissioned to be built on Main Street. To the five young men in the preparatory class, eight men and four women in the freshman class, six courses of instruction were offered: electrical engineering, domestic science, art, machine work and smiting, woodwork and pattern making, and normal manual training. By 1907 the school was offering additional bachelor's degrees in mechanical, civil, and chemical engineering.

Recognizing the need for a gymnasium, the students began a fund-raising campaign for the $11,000 needed to build one in town, spurred on by a $5,000 gift from the Clarkson family. By 1912, this second school building had been erected. That building became the library in 1956 after the new Alumni Gymnasium opened. When the library moved to the Educational Resources Center in 1978, the original building became the Liberal Studies Center.

When the New York State Board of Regents offered scholarships to qualified students attending college within the state in 1913, Clarkson's Board of Trustees voted to change the school's name to the Thomas S. Clarkson Memorial College of Technology; the head of the college became president instead of director; and John Pascal Brooks, a Dartmouth graduate, and one of the men on Walter Camp's first All-American football team, became the first Clarkson director to bear the title of President.

Hockey began in 1919 on a rink behind Old Main, and soon moved to a bigger rink built by the students in Ives Park. Not until the hockey arena was completed on land across the river in 1938 did the team have a building in which to play. That facility was later named for the founding force behind Clarkson hockey, Murray Walker, owner of Weston's Bookstore. Walker Arena provided home ice for Clarkson teams, which have frequently achieved national ranking, until Cheel Arena was completed in 1991. The Women's Hockey Team is 3 time NCAA national champions in 2014, 2017, and 2018.

Thomas Clarkson's nieces, Miss Annie Clarkson and Miss Emily Moore, tried to have the entire school moved to a new campus on a hill outside of Potsdam (hence the nickname, the "hill campus"), with a gift of $1.5 million in 1929. However, because that

money shrank to half a million within a year due to the stock market crash, the plans for the move had to be shelved for over 30 years. Since then, the campus has moved almost entirely to the hill, although some administrative offices and the programs in health sciences remain on the original downtown Potsdam campus.

Responding to a plea from New York Governor Thomas Dewey after World War II, Clarkson admitted hundreds of returning veterans. Having no space to house or teach them by 1946, Clarkson rented the New York State School for the Deaf in Malone, N.Y., 40 miles east of Potsdam. For the next five years, freshmen and many sophomores spent their first two years in Malone before moving to the Potsdam campus for the remainder of their Clarkson education. That branch closed in 1951.

With that flood of veterans came the Trustees' realization that the College would have to expand its facilities, and expand them it did over the next 20 years, adding not only facilities but graduate programs in engineering, science, and management, including PhD programs in most.

During that post-war period, and through the mid-1980s, Clarkson expanded both of its campuses, with many new residence halls on the hill campus, including Hamlin-Powers, the Quad, Moore House, Price and Graham Halls, Woodstock (originally planned for married student housing only), and the Townhouses. Beside them, it built the Educational Resources Center in 1978 and then added recreational facilities of the Indoor Recreation Center in 1980. The downtown campus also witnessed expansion during those years; Peyton Hall for chemical engineering, Damon Hall for civil engineering, Clarkson Hall for electrical engineering, and Lewis House for a student union. Clarkson also gradually took over Snell Hall from SUNY Potsdam for classrooms and office space.

In the fall of 1991, two significant developments occurred on the hill campus. Clarkson opened the CAMP (Center for Advanced Materials Processing) building, a research and teaching complex with state-of–the-art laboratories, designated a New York State Center of Advanced Technology. The building was connected to the existing Rowley Laboratories and, in the fall of 1996, all engineering departments were consolidated in the CAMP-Rowley complex.

Also in 1991, the University opened the Cheel Campus Center, a combination student union and hockey arena that includes dining areas, student government and activities rooms and offices, and a post office. In the fall of 1998, the University also completed a new Fitness Center, which connects the Indoor Recreation Center and Alumni Gymnasium.

In the spring of 1999, Clarkson Hall was renovated and rededicated as the Center for Health Sciences. This downtown facility now houses the University's programs in Occupational Therapy, Physical Therapy, and Physician Assistant Studies. The newest academic building, Bertrand H. Snell Hall, opened on the hill campus for the fall 2000

semester. A wing of biochemistry laboratories was added to the Cora and Bayard Clarkson Science Center and opened in fall 2005. The Technology Advancement Center (TAC), an 18,000-square-foot addition connecting the Schuler Educational Resources Center and the Cora and Bayard Clarkson Science Center, was completed in fall 2008. A new Student Center was completed in August 2010 and connects all academic buildings. In 2017, #ClarksonIgnite was introduced as a new approach and catalyst for exploring, creating and achieving what's next. Through a renovation to the Schuler Educational Resource Center, an Innovation Hub was created to ignite connections across academic disciplines, cultures and industries to create the entrepreneurial mindset, knowledge and intellectual curiosity needed to innovate world relevant solutions.

In 2016 The University welcomed a Graduate School campus in Schenectady, New York that takes advantage of all that New York's Capital Region has to offer. Like Potsdam, Schenectady has a large collegiate presence (Union College and Schenectady Community College in the same city) as well as many other educational institutions, research institutes and government think tanks.

ACADEMIC PROGRAMS

Bachelor's Degree Majors

All bachelor's degree programs at Clarkson require completion of 120 credit hours and the learning expectations of the Clarkson Common Experience. In addition to traditional discipline-specific degrees, Clarkson offers majors that combine work from at least two different fields so that students can broaden their areas of expertise. Program length for a bachelor of science degree is four years.

A description of each degree program and its requirements can be found below. The Higher Education General Information Survey (HEGIS) code designated by the New York State Educational Department for classifying these academic programs can be found in the list of degree programs and HEGIS Codes near the end of the catalog. Clarkson offers the Bachelor of Science (BS) degree in the following majors:

School of Arts & Sciences	
American Studies	History
Applied Mathematics & Statistics	Interdisciplinary Liberal Arts
Biology	Interdisciplinary Social Sciences
Biomolecular Science	Literature
Chemistry	Mathematics
Communication, Media, & Design	Physics
Computer Science	Political Science
Data Science	Psychology
Digital Arts & Sciences	

David D. Reh School of Business	
Business Intelligence and Data Analytics	Innovation & Entrepreneurship
Engineering & Management	
Financial Information & Analysis	
Global Supply Chain Management	

Wallace H. Coulter School of Engineering	
Aerospace Engineering	Electrical Engineering
Chemical Engineering	Environmental Engineering
Civil Engineering	Mechanical Engineering
Computer Engineering	

Institute for a Sustainable Environment (ISE)	
Environmental Health Science	Environmental Science & Policy

Interdisciplinary Programs	
Mathematical Economics	Software Engineering
(See ISE for additional programs)	

Institute for STEM Education

Double Majors and Second Clarkson Degrees

Undergraduates may also enhance an academic major by combining it with a second major. This may lead to a single bachelor's degree with a double major or to two Clarkson bachelor's degrees.

Minors

To complement and enrich bachelor's degree programs, Clarkson also enables students to assemble coursework in designated minor programs. Such minors provide students with another area of specialization outside their major. Minors require 15 or more credit hours of specified coursework. Completion of an approved minor is indicated on a student's transcript.

Humanities and Social Sciences also offer disciplinary minors and student-designed minors not in the below list. See Minors in Humanities and Social Sciences in the School of Arts & Sciences section of the catalog or contact the chair of the Department of Humanities and Social Sciences.

School of Arts & Sciences Minors	
American Studies	International and Cross-Cultural Perspective
Anthropology	Interdisciplinary Social Sciences
Biology	Law Studies
Biology, Behavior & Society	Literature and Arts
Biophysics Chemistry	Mathematics
Chemistry	Medicine and Healthcare
Cognitive Neuroscience	Philosophy
Communication	Physics
Computational Science	Political Science
Computer Science	Psychology
Gender & Sexuality Studies	Science, Technology and Society
History	Sociology
Individually Designed Minor	Statistics
Information Technology	War Studies
David D. Reh School of Business Minors	
Business	Law Studies
Corporate Innovation	New Product Development and Marketing
Economics	Project Management
Human Resource Management	

Wallace H. Coulter School of Engineering Minors	
Electrical Engineering	Biomedical Engineering
Engineering Science	Sustainable Energy Systems Engineering
Environmental Engineering	
Software Engineering	

Institute for STEM Education Minors
Pre-Teaching

Interdisciplinary Minors	
Biomedical Engineering	Biomedical Science and Technology
Robotics	

Institute for a Sustainable Environment (ISE) Minors	
Environmental Health Science	Sustainable Energy Systems Engineering
Environmental Science	Sustainable Solutions for the Developing World
Environmental Policy	

Professional Concentrations

Undergraduate students may build an area of specialized expertise termed a professional concentration within, or closely related to, their degree program major. Such concentrations require at least 15 credit hours of coursework. Successful completion of a faculty- approved concentration is indicated on a student's transcript. Course requirements vary and interested students should consult with academic advisers. The following professional concentrations have been designated:

School of Arts & Sciences
Health Psychology

David D. Reh School of Business
Accounting

Wallace H. Coulter School of Engineering	
Biomolecular Engineering	Structural Engineering
Construction Engineering Management	Water Resource Engineering
Environmental Engineering	Architectural Engineering
Electric Power Engineering	
Manufacturing Engineering	

Institute for a Sustainable Environment (ISE)	
Environment and Security	Industrial Hygiene
Ergonomics	

Accreditation

Clarkson is accredited by:
Middle States Commission on Higher Education,
3624 Market St, Philadelphia, PA 19104-2680
215-662-5606.

The undergraduate programs in aerospace, chemical, civil, computer, electrical, environmental, mechanical, and software engineering are accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org/. Students who have completed at least three years towards a bachelor's degree in engineering are eligible to take the Fundamentals of Engineering examination toward licensure as professional engineers.

The School of Business is accredited by the Association to Advance Collegiate Schools of Business (AACSB). The undergraduate engineering and management program in the School of Business is also accredited by Engineering Accreditation Commission of ABET, https://www.abet.org/.

In addition, the University and its curricula are approved by the New York State Board of Regents. All Clarkson degree programs are approved by the New York State Division of Veterans Affairs for the training of veterans and other eligible persons.

ACADEMIC REQUIREMENTS FOR UNDERGRADUATE STUDENTS

The Clarkson Common Experience

A Clarkson education prepares each student for today's world and tomorrow's challenges. All Clarkson students are required to meet the learning expectations of the Clarkson Common Experience. The Clarkson Common Experience integrates each student's learning in a major field of study with learning expectations that broaden the student's understanding of our modern world. Each Clarkson graduate achieves objectives in fundamental academic abilities, in personal and social development, and in prescribed areas of knowledge.

Learning expectations of the Common Experience

Each Clarkson graduate will achieve academic abilities that include:

1. Mastery of a major field of study;
2. Effective communication in oral, written, and technological forms, critical and imaginative thinking; and
3. Problem solving skills using both quantitative and qualitative reasoning where appropriate

Each graduate is also expected to experience personal and social development that includes:

1. An increased understanding of and insight into his or her own behavior
2. An appreciation of the need for self-motivated life-long learning
3. An increased social awareness and interpersonal competence, including an appreciation for the value of experiencing diversity; and
4. An understanding of and recognition of the need for personal, societal, and professional ethics

Knowledge is the essence of a university education, and each Clarkson graduate is expected to become knowledgeable beyond his or her major field in these areas:

1. The nature of culture and societies
2. Contemporary and global issues
3. The imaginative arts and their role in society
4. Science and technology, including their relationship to society and their impact on the environment
5. Economic and organizational concepts and decision-making; and
6. Methods for studying and explaining individual and group behavior

Components of the Clarkson Common Experience

The Clarkson Common Experience provides a common set of learning expectations and outcomes for all Clarkson students. To achieve these outcomes, each student is required to complete a set of courses and a professional experience. Course work consists of required and elective courses both from within a student's major field and from across the spectrum of all disciplines in the university. Embodied in the Common Experience are four components that serve as common threads through multiple courses:

1. Learning to communicate effectively
2. Developing an appreciation for diversity in both working and living environments
3. Recognizing the importance of personal, societal, and professional ethics
4. Understanding how technology can be used to serve humanity

Each of these components is introduced early in the curriculum, reinforced in subsequent courses, and included in upper division courses.

The Communication Component

To develop excellent communication skills, Clarkson requires communication intensive coursework, first in UNIV 190, The Clarkson Seminar, then across the curriculum and in the major. Courses designated as writing intensive are assigned communication points on a scale of one of two (C1 or C2) to indicate the extent of communication experience in that course. Beyond UNIV 190, The Clarkson Seminar, students must obtain six more "communication points," at least two of them within the major at the 300/400 level. Communication points can be obtained by taking designated courses, or, with approval, through co-curricular experiences. Depending on initial abilities and background, students may also be required to enroll in a course that provides writing instruction and support for UNIV 190. Students for whom English is a second language must also meet the ESL requirements as described below.

The Diversity Component

From the moment they arrive on campus, Clarkson students prepare for the culturally diverse environments they will inevitably experience in their future careers. FY100, First-Year Seminar, helps students "respect and learn from Clarkson's diverse community." In UNIV 190, The Clarkson Seminar, students will be urged to question their own assumptions and to consider different worldviews. Later in their academic coursework, students will gain a deeper understanding of cultural diversity within and among societies, recognizing how it influences their own actions and affects the lives of those around them. The professional requirement in the major area of study will prepare students to enter the global workforce by helping them understand the importance of diversity in the workplace.

The Ethics and Values Component

Through a repeated emphasis on ethics and values, Clarkson promotes in its students the profound reflection necessary to sustain personal, academic, professional, and

civic integrity. Students are expected to view this process not just as an academic issue, but as critical for all aspects of their lives, including community activities, sports, student organizations, and work. Issues of personal ethics and values are addressed beginning with FY100, First-Year Seminar. Social and cultural values are discussed as part of UNIV190, The Clarkson Seminar. Several courses in the knowledge sequence emphasize social and cultural values or philosophical and ethical issues. In the Professional Requirement, students identify ethical problems in situations typically encountered within their professions and analyze these issues from different ethical perspectives.

The Technology Component

All Clarkson students are expected to understand the basis of our modern technological society and to gain an appreciation for both the potential benefits and limitations of technology. Students will be introduced to the basic knowledge necessary for understanding technology through two courses in mathematics and two courses in the natural sciences, including at least one with a laboratory component. A technology course is required that reinforces this knowledge in the context of demonstrating how technology may be used to serve humanity. The interrelation of science, technology and society is studied in one of the knowledge area courses.

Requirements of the Clarkson Common Experience

FY 100, First Year Seminar. First Year Seminar treats personal and social adjustment topics as well as Clarkson values, ethics, and diversity (Fall Semester, required only for first year students).

UNIV 190, The Clarkson Seminar

The Clarkson Seminar welcomes first year students into a world of cultures, histories, and the global forces that will shape their personal and professional lives beyond their Clarkson education. Students will define issues within a broad cultural context and gain experience in evaluating and interpreting texts. Seminar classes will be small and thematically structured, with an emphasis on discussion, critical reading and thinking, extensive writing, and collaborative work (Fall Semester).

Knowledge Areas and University Courses

Students achieve learning outcomes in six broad areas of knowledge. Students are required to take at least five courses that have Knowledge Area designators, and the five courses must cover at least four of the six Knowledge Areas listed below:

1. Cultures and Societies (CSO)
2. Contemporary and Global Issues (CGI)
3. Imaginative Arts (IA)
4. Science, Technology, and Society (STS)
5. Economics and Organizations (EC)
6. Individual and Group Behavior (IG)

Additionally, at least one of these five courses must be a University Course that has two Knowledge Area designators. University Courses are multidisciplinary and address learning outcomes in two of the six areas of knowledge, and students observe and participate in the interaction of disciplines.

Mathematics, Science and Technology Courses

Students must achieve learning outcomes in basic mathematics, science and technology by completing five courses in these areas. Students develop quantitative literacy through the study of mathematics, including probability and statistics. Students must take two courses in mathematics as specified by the major. Students develop an understanding of the principles of science and technology through two natural science courses, at least one of which must have an integrated laboratory component. Students gain an understanding of how technology is developed through a Technology Course that addresses the theme of technology serving humanity.

Communication

Clarkson places a strong emphasis on developing students' abilities to communicate effectively in a variety of contexts using diverse forms of communication. Students must select coursework and possibly extra-curricular activities that carry a total of at least six communication points. Courses and activities with a communications component will be identified as carrying either one or two points. At least two points must come from within the student's major discipline in a course at the 300 or 400 level.

Major Field of Study

A significant characteristic of the Common Experience is the integration of requirements from both outside and within a major field of study. Each student pursues a degree program in a major field and completes a set of prescribed courses to demonstrate mastery of that field. As part of these courses, students achieve outcomes of the Common Experience.

Information Technology Expertise

Students will gain expertise in using information technology and computational software appropriate to their major field of study.

Professional Requirement

The Professional Requirement incorporates learning outcomes involving professionalism, ethics, and diversity. These outcomes include understanding the concepts of professionalism, professional responsibility, and professional ethics, and knowing how the student's professional community promotes, supports, and enforces these concepts. Students should develop an appreciation for the value of diversity in the workplace.

Professional Experience

All students participate in a project-based professional experience following the first year such as co-op, internship, directed research, or community project clearly related to the student's professional goals.

BACHELOR'S DEGREE GRADUATION REQUIREMENTS

1. At least 120 credit hours
2. At least a 2.000 cumulative average
3. At least a 2.000 cumulative average in the major field of study for the Class of 2004 or later
4. Meet the requirements of the Clarkson Common Experience
5. Meet the requirements for a degree program as determined by the offering department or school
6. A student entering as a first semester freshman must have been in residence for at least four semesters, including the final undergraduate semester; or, if entering with advanced standing, have completed at least half the remaining upper-level undergraduate work in residence at Clarkson. The program must include a minimum of two semesters (30 credit hours) including the final undergraduate semester

EAP/ ESL Requirements

Students for whom English is a second language must take an English language placement examination upon entering Clarkson. Based on the outcome of this examination, a student may be required to complete one or more English for Academic Purposes (EAP, formerly ESL) courses prior to enrolling in UNIV 190, or any course assigned one or two communication points.

NOTE: International students who enter as first-year students and are placed in EAP course(s) may substitute another course for UNIV190, The Clarkson Seminar. The substitute course (1) must have a C1 or C2 designation and (2) must have at least one of the Knowledge Area designators (CGI, CSO, EC, IA, IG, STS) and come from the humanities and/or social science disciplines. The substitute course must be IN ADDITION TO the 5 required Knowledge Area courses.

Grading System

Grades are reported in accordance with the following system:

A+	Passed with 4.000 quality points per credit hour
A	Passed with 4.000 quality points per credit hour
A-	Passed with 3.667 quality points per credit hour
B+	Passed with 3.334 quality points per credit hour
B	Passed with 3.000 quality points per credit hour
B-	Passed with 2.667 quality points per credit hour
C+	Passed with 2.334 quality points per credit hour
C	Passed with 2.000 quality points per credit hours
C-	Passed with 1.667 quality points per credit hours
D	Lowest passing grade with 1.000 quality points per credit hour
F	Failed with 0.000 quality points per credit hour

Therefore, a student who passes a 3-hour course with an A will earn 3 x 4.000 or 12.000 quality points; an A-, 3 x 3.667 quality points, etc. The quality-point average is determined by dividing the total number of earned quality points by the total number of credit hours taken at Clarkson on a traditional basis (A+, A-, B+, B …). Selected courses may be taken on the Pass/ No Credit system where P is passed, quality point average not affected; NC (no credit) on student's record for C-, D, or F grade in courses taken as Pass/No Credit, quality point average not affected.

Academic Standing

Academic Warning	A full-time undergraduate student in Good Standing whose current semester quality point average (QPA) falls below 2.000 shall be placed on Academic Warning. To be removed from Academic Warning, back to Good Standing, a student needs to complete at least 12 credit hours with a current semester QPA of at least 2.000.
Academic Probation	A full-time undergraduate student on Academic Warning who fails to complete at least 12 credit hours with a current semester QPA of at least 2.000 will be placed on Academic Probation. To be removed from Academic Probation, back to Academic Warning, a student needs to complete at least 12 credit hours with a current semester QPA of at least 2.000.
Academic Separation	A full-time undergraduate student on Academic Probation who fails to complete at least 12 credit hours with a current semester QPA of at least 2.000 will be separated from the University. Any undergraduate student who fails to attain a current semester QPA of at least 1.000 shall also be separated from the University.
To be continued, if separated	An undergraduate must request continuance by submitting a request for continuance form available in myCU. Former students who have been away from Clarkson for at least one semester following an academic separation must request readmission by submitting a Request for Readmission Following Separation form which can be found on the website at https://www.clarkson.edu/continuance-and-readmission one month before the beginning of the semester the student wishes to return to the Continuance and Readmission Review Committee at the following e-mail address: registrar@clarkson.edu. The student needs to complete all answers on the form and provide the program(s) of study the student wishes to be continued in. All cases on continuance require approval of the University's Continuance and Readmission Committee. If continued, a student's academic standing will be Academic Probation

The Academic Standing acquired at the end of the semester shall take effect at the beginning of the next summer school or semester in which the student enrolls.

Although a student's GPA may subsequently change due to courses being repeated or omitted, academic standing will not change; academic standing is based solely on the original semester performance.

Further information may be found in the Undergraduate Regulations Section III-R, Academic Standing.

Dean's List and Academic Scholar List (Academic Honors)

To qualify for the Dean's list during any semester, a full-time undergraduate student must receive no failures and earn a semester quality point average of at least 3.250 in at least 14 credit hours. A 3.800 semester quality point average or better (in at least 14 credit hours) qualifies a student for the Presidential Scholar List.

Both lists require a student to be enrolled for at least 14 credit hours in a prescribed curriculum of which 12 or more credit hours are graded in the traditional manner (not graded on a pass/no credit basis).

Degree with distinction

A student will receive the bachelor's degree "with distinction" if his or her cumulative quality point average is at least 3.250, and "with great distinction" if it is at least 3.750.

Double Major and Second Degree

A single Clarkson bachelor's degree with a double major is awarded when the student satisfies all curricular requirements for two Clarkson bachelor's degree programs, but does not qualify for a second degree.

A student can be awarded two Clarkson bachelor's degrees. A student qualifies for a second Clarkson bachelor's degree if he or she satisfies all degree requirements for two different Clarkson bachelor's degree programs and has a minimum of 150 credit hours, including at least 30 credit hours unique to each program.

ACADEMIC AFFAIRS

The Office of the Provost

Goodarz Ahmadi, Interim Provost
Amanda Pickering, Associate Vice Provost of Academic Affairs & Student Achievement
Christopher Robinson, Associate Provost for Faculty Achievement

The Office of the Provost supports the many functions that contribute to the academic mission of the University through teaching, research and scholarship, and academic service. Fostering a vibrant academic community that promotes learning, inspires innovation and entrepreneurship, and actively seeks diversity across the portfolio, the Office is responsible for vision and guidance in ensuring excellence in academic programs, standards, and processes. The Provost Office ensures the presence of the highest quality faculty, relevant academic program offerings with the highest standard of student learning outcomes, and develops leadership at various levels of the academic organization.

Honors Program

Kate Krueger, Director
kkrueger@clarkson.edu

Clarkson offers a separate four-year undergraduate Honors curriculum for motivated, curious students majoring in any of our degree programs. Honors students are engaged learners who collaborate and work with each other, our campus, and our community to research solutions and solve problems. Clarkson Honors fosters the potential of students and faculty who, together, create a transformative educational experience. From this foundation, Honors students pursue deep learning in research and in hands-on experiences, culminating in a capstone they design. This community-based model means Honors students lean on and learn from each other, take the same Honors courses together, live together, socialize together, and support each other throughout their time at Clarkson. Honors students must maintain a grade-point average of 3.25 and keep up with the program's service requirement to remain in good standing.

Applicants to the Honors Program must complete an online application, which includes two short essay questions, a résumé, and a "show and tell" question about their passions. The Honors Program admits up to 60 new first year students and up 10 sophomore or junior students per year

Clarkson Honors complements curriculum in all majors, emphasizing the development of critical thinking, problem solving, teamwork, and communication skills. Students take one Honors course per semester. Courses develop as interlocking, multidisciplinary sequences, bringing perspectives from different academic disciplines to bear on

contemporary problems at the interface of science, technology and society. The Honors approach is open-ended and project-based.

The Honors curriculum is a unique four-year sequence of courses specifically designed for Honors students in which students develop skills in teamwork, problem-solving, ethical decision-making, and oral and written communication. The Honors track replaces the Clarkson Knowledge Areas and offers different (but not additional) coursework to complement Honors students' major coursework. Clarkson Honors courses capitalize on the strengths of the Honors community: we emphasize diverse academic disciplines and social perspectives, so the courses complement any major and strengthen your own skills. The climax of this sequence is the Honors capstone, in which each student defines and explores an original topic.

Clarkson Honors also offers students opportunities to engage in original research through its summer research programs where students participate in cutting-edge research with faculty mentors for up to ten weeks. The Honors five-week "pre-frosh" summer research program also provides a unique opportunity for incoming first year students before they matriculate at Clarkson.

All students must complete an Honors capstone of their own design which is generally imagined and completed in their junior and senior year under the guidance of their Honors advisor and a faculty member. A wide range of topics and formats is accepted, from laboratory research to business plans, from engineering design to creative artwork, and from software applications to co-op assignments and internships.

Honors students enjoy many other benefits, including:

1. The Honors Scholarship as part of their Clarkson financial assistance package;
2. The Honors Educational Enhancement Scholarship that funds high impact scholarly and professional development activities;
3. A residential living-learning community; and
4. Holistic Honors advising

The Honors Program at Clarkson is supported by an Honors Council composed of representative faculty and staff, and Honors students who are elected by their peers to serve on the Honors Student Steering Board.

Early Entrance College Program: The Clarkson School

Ben Galluzzo Head of School
bgalluzz@clarkson.edu

The Clarkson School is a unique program for talented high school age students who are ready to begin college early. Unlike many early-entrance college programs, The Clarkson School provides a full-time residential program and dedicated advising that facilitates the transition to college life. The Clarkson School has been bringing academically advanced students to Clarkson University since the fall of 1978.

Students who enroll in The Clarkson School live together on campus in a community with specially trained residential advisors and upper class mentors. Commuting day students from St. Lawrence County may also join the community. Our students are matriculated as first year University students and typically earn about 32 - 34 college credit hours during the year. Courses are selected from the University's offerings across the curriculum in the School of Arts & Sciences, Business, and Engineering. With assistance from the school staff, students design their programs of study to meet their individual interests and needs.

The low student-staff ratio of The Clarkson School ensures individualized attention. Our advising programs emphasize time-management and study skills that are essential for success in college. We assist in career and major exploration and each student's progress toward their goals is carefully monitored. Individualized assistance is provided where necessary. Our Professional Development Program is designed to complement the academic experience: workshops focus on resume and cover letter writing, preparation for career fairs and job interviews, writing personal statements, financial aid, summer research opportunities, and other topics. We believe that through such enrichment programs, our students will grow personally and professionally to become fully contributing members of our community and of their communities in the future.

Monthly family dinners are held to build a sense of community amongst The Clarkson School students and they are themed to address the needs of first year students. For example, students enjoy guest speakers, meeting faculty mentors and alumni of The Clarkson School, an "etiquette dinner" as well a dinner at the President of the University's home. Field trips are also an integral part of the program, and they typically combine educational and community-building activities. The Clarkson School students may also participate in University organizations and clubs, including intercollegiate and intramural sports.

Upon satisfactory completion of the year, students may automatically continue as sophomores at Clarkson University. In most cases, our students are given credit and appropriate advanced placement at other institutions. The staff provides guidance and help for those who wish to continue their education at other colleges and universities.

The cost of The Clarkson School is comparable to the cost of a year at Clarkson University. Merit and need-based financial aid is available to all accepted students. Please note that students who elect to remain concurrently enrolled in high school while attending The Clarkson School are not eligible for federal financial aid. Credit may be given for Advanced Placement or college courses taken in high school, dependent on scores or grades achieved.

Applying to the Clarkson School

The Admission Committee evaluates each applicant's credentials with great care. In general, applicants accepted to The Clarkson School demonstrate personal maturity, high levels of achievement in their academic work, and engagement in extra-curricular activities. In order to determine whether a student is ready for the early college experience at The Clarkson School, we consider academic preparation as evidenced in the cumulative GPA, rank in class, standardized test scores, and the rigor of the curriculum the student has taken. Attention is also given to letters of recommendation as further evidence the student is prepared for the early college experience.

A completed application portfolio includes The Clarkson School Application, Essay, Secondary School Report, official high school transcript, standardized test scores, and at least two letters of recommendations. There is a $50 Application Fee, along with a $500 Enrollment Deposit for accepted students who wish to reserve a spot in the class.

All applicants are strongly encouraged to visit for an interview and campus tour. Students who interview with an Admission Representative for The Clarkson School will have their application fee waived.

The priority application deadline is June 1, but earlier application is highly recommended. Admission decisions are made on a rolling basis for students who have completed their Application Portfolio. Please note that all students are admitted to The Clarkson School subject to policies and procedures set forth in The Clarkson School Admission guidelines.

To request an Application Portfolio or more information, call or write to:

Director of Admission, The Clarkson School, Clarkson University
Box 5650, Potsdam, NY, 13699
1-800-574-4425 or 315-268-4425
tcs@clarkson.edu

Student Achievement Services (SAS)

Amanda Pickering, Associate Vice Provost of Academic Affairs & Student Achievement

Clarkson SAS is unique in offering a one stop shop to integrate Student Achievement Services typically associated with the Registrar, Advising, the Bursar and Financial Aid offices into an intricate and collaborative network.

Not only do we fulfill most student transactional objectives, but we understand circumstances related to billing, financial aid and academic progress supporting career aspirations, allowing us to provide a holistic advisement model to student achievement.

At the heart of SAS are professional specialists who are available to offer a concierge approach to assist students with degree planning and related information to academic experiences to foster life-long success.

Office of University Advising

Catherine Avadikian, Director
Jeremy Riedl, Advising Specialist
Shantel Ingersoll, Advising Specialist
Amber Cherfils, Advising Specialist
Lisa Emburey, University Reservationist / Administrative Assistant • Student Achievement Services

The Office of University Advising (OUA) is a centralized University-Level resource to all undergraduate students, their advisors, and partnering entities. OUA provides key infrastructural support to ensure advising consistency, equitable access, quality assurance, and continual assessment to meet strategic metrics in support of student achievement and persistence to graduation.

Undergraduate student advising is complex. In the simplistic view, “advising” is all about one meeting per semester to assist students in picking courses for the next term. But the literature, and our experience, tells us there is much more: defining career and life goals; planning internships; plotting a course to graduate school; finding time for study abroad or the Adirondack Semester; additional load from ROTC or sports; and dealing with homesickness and roommate issues. Advising is integrating the academic curriculum to students’ life aspirations and career goals.

OUA fosters services related to key student achievement initiatives outlined below:

Affinity Advising Expertise	Advising Workshops/Sessions
University Studies	New Employee Orientation
Bachelor of Professional Studies BPS	Pre-Matriculation Advising
Pre-Health	Faculty Advisor Training
Transfer	Lunch & Learn Workshops
Major Scholarships	Advisor Resources
Student-Employee Advising	New Student Orientation
High School Enrichment Advising	

Student Persistence	Equitable Advising Access
Integrated Advising Support	Faculty Liaise Partnerships
Continuance & Readmission	Advisor Resource Management
SafetyNet Partnership	Student Advising Resources
Low Enrollment Assessment	Centrally-located Advising Office
Financial Aid & Student Accounts Collaborative	
Student Learning Outcomes Assessment Partner	

Transfer Advising

Amber Cherfils, Student Advising Specialist
acherfil@clarkson.edu

Professional advisors in the Office of University Advising provide outreach to new transfer students to support them in their transition into Clarkson. The Office of University Advising serves as a contact point for transfer students by providing answers to general questions such as those pertaining to their transfer course work, summer school prep, career information and other areas of interest such as minors, double majors etc.

Pre-Health Professions Advising

Damien Samways, Associate Professor and Chair of the Pre-Health Advising Committee
Shantel Ingersoll, Freshman and Sophomore Pre-Health Advisor
healthadvising@clarkson.edu

Students receive advising to prepare them for acceptance into professional school for the health sciences...through any major at Clarkson. For a more structured path into these professions, students can choose to complement their primary degree with a minor in Medicine and Health Care, which includes courses covering the interdisciplinary range of knowledge and perspectives necessary to be an effective health-practitioner. Regardless of the undergraduate path taken, Clarkson's Health Professions Advisory Committee meets with students individually as they progress through their courses of study, providing guidance and advice in meeting University and departmental requirements and ensuring preparation for entrance into professional schools.

Pre-Occupational Therapy and Occupational Therapy
Clarkson offers an undergraduate Pre-OT advising program and a graduate degree program in Occupational Therapy. Students interested in preparing for entrance into Clarkson's Masters of Occupational Therapy degree program should contact the department at 315-268-4412.

Pre-Physical Therapy and Physical Therapy
Clarkson offers an undergraduate Pre-PT concentration and an entry level Doctor of Physical Therapy graduate degree program. Students interested in preparing for entrance in Clarkson's Doctor of Physical Therapy degree program should contact the department at 315-268-3786.

Pre-Physician Assistant and Physician Assistant Studies
Clarkson offers an undergraduate Pre-Physician Assistant advising program and a graduate degree in Physician Assistant Studies. Students interested in preparing for entrance into Clarkson's Master of Physician Assistant Studies degree program should contact the department at 315-268-7942.

Pre-Health Tracks
Students intending to apply to professional school for any of the health sciences (including, but not limited to, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Science, Pre-Optometry, Pre-Pharmacy, Pre-Chiropractic) will receive guidance in the planning and completion of required coursework and professional experience, in addition to assistance in submitting their final application. Clarkson provides committee letters to accompany applications when requested and also offers a preparatory course for students required to sit the MCAT.

Students may contact healthadvising@clarkson.edu for further details.

Pre-Law Advising

Christopher Robinson, Professor of Political Science/Associate Provost for Faculty Achievement
crobinso@clarkson.edu

Students from many degree programs at Clarkson have entered law school. Educators agree that success in a law career depends more upon the development of skills and habits conducive to legal reasoning than a student's specific major. Students planning to seek admission to law school should use elective courses to develop a broad cultural background; intellectual curiosity; and reading, writing and speaking skills. Students interested in law school may consider completing the Law Studies Minor. Courses in business, engineering, and science help develop analytical skills and the technical background often helpful in understanding potential legal problems. Liberal Arts courses in the humanities and social sciences provide broad cultural background and the opportunity to develop analytical and verbal skills, since they entail a wide range of reading assignments, emphasize class discussion, and offer students the opportunity to prepare and criticize oral and written work.

Clarkson University and University of New Hampshire School of Law, Franklin Pierce Law Center, Concord, New Hampshire, have signed an articulation agreement for students interested in pursuing a law degree specializing in intellectual property law. Franklin Pierce Law Center is an internationally known school training specialists in patent law and other intellectual property fields.

Students admitted to Clarkson as first-year students can file a joint admission application with Franklin Pierce. When they complete their baccalaureate degree from Clarkson, they will be fully admitted to the Franklin Pierce Law Center providing they have a final undergraduate grade-point average of at least 3.25, an LSAT (Law School Admissions Test) score at or above the 75th percentile, and that they have not engaged in any intentional academic misconduct or criminal activity. Pre-law advising is available for students in all majors to help them develop academic programs that will serve as a strong foundation for future legal studies. A list of pre-law advisors is available through the Dean's Office in the School of Business at 315-268-2300. The advisors provide counseling and information about law schools and careers in law.

Multidisciplinary Project (MP) and Multidisciplinary Team (MT) Courses

Clarkson has developed courses to provide students with the opportunity to solve real-world design problems in a team-based multidisciplinary atmosphere. Often these courses culminate in national competitions. Such multidisciplinary project experience has been increasingly valued by recruiters in the corporate marketplace. MP courses provide course credit, while MT courses carry no credit, but participation is recorded on the student's transcript.

Summer Sessions

Clarkson offers summer sessions for undergraduates. A well-balanced offering of courses enables students to:

1. Participate in programs such as Cooperative Education of study abroad and still graduate with their class;
2. Enrich their academic program with electives that do not fit into the normal semester; or
3. Take courses required for continuation in a specific program or transfer into a new area.

Three-Year Bachelor's Degree Option

Students who have graduated in the top ten percent of their high school class and who enroll in a Business or Arts & Sciences major may complete a bachelor's degree in three calendar years. To satisfy this accelerated schedule, students apply Advanced Placement credits and/or work on special research projects during the summer.

University Studies Advising

Catherine Avadikian, Director
oua@clarkson.edu

The University Studies Program was designed to serve those individuals who are ready to enter into their freshman year of college without making an initial commitment to a major field of study. It enables students to more fully investigate the full range of academic offerings relating to their specific academic and career interests. Students registered under University Studies are full-time matriculated undergraduate students who have yet to declare a specific major area of study. In all cases, a selection of an academic major will occur prior to the end of the freshman year.

The program is structured and designed to assist students in making a sound, educated, and well thought-out decision about an appropriate major. In the first year, students are placed in courses based on their interests and recommendation of their advisorso within two semesters, they will be able to enroll in a major of their choice and still earn a bachelor's degree in four years.

Additionally, students are encouraged to participate in professional societies and activities that help to define their academic goals and career-related objectives.

Personalized academic advising is emphasized and students are directed to take full advantage of related services available to them at Clarkson.

Individually Designed Bachelor of Professional Studies Program - BPS

Catherine Avadikian, Director
bps@clarkson.edu

In addition to the Bachelor of Science (BS) degree, Clarkson offers a Bachelor of Professional Studies degree, individualized major, providing flexibility and interdisciplinary study. The BPS enables a student to design and pursue an individual curriculum that meets personal career objectives. Programs may be designed in any discipline or by combining disciplines offered at Clarkson. The BPS is offered both full-time or part-time and may be completed in residence, distance format, or a combination of both.

Non-Degree Students

sas@clarkson.edu

An individual may enroll at Clarkson University for non-degree study on either a full-time or a part-time basis. Although such individuals are classified as non-matriculating, they are provided an opportunity for academic study in areas of interest. This status may be used to obtain exposure in a particular area as a

foundation for further academic work. Many persons with a degree use this status to gain exposure to another discipline without pursuing a degree.

Undergraduate students who are enrolled as non-degree students may not earn a degree from the University without gaining admission to an undergraduate degree-granting program. Non-degree students may accumulate up to 15 hours of coursework credit while in this status and must matriculate into a Clarkson degree program to earn credit beyond this. Persons interested in admission as a non- degree student should contact Student Administrative Services. Non-degree students must obtain approval for courses they want to enroll in from the Director of Academic Advising. This approval is given on the basis of the student's academic preparation/background and personal goals. Students have no class standing and are not eligible to participate in any extracurricular activities involving intercollegiate competition.

Major Fellowships and Awards

Clarkson's Advising Service for Major Fellowships, Scholarships & Awards promotes the full potential of award candidates through a deep learning experience, developing scholars by way of one-on-one advising throughout the application process to facilitate rigorous intellectual and personal growth. Advising guides undergraduates, graduate students, and alumni through the major award application process and serves to leverage their high-quality research and scholarship education into transformative and life-long success within their careers and as citizens of their communities. This service provides outreach to all students and campus partners on available awards, such as Fulbright, Udal, Goldwater, and works in concert with Clarkson's globally-oriented faculty and staff to identify qualified students and awards suited to their future goals while facilitating national scholarship competitions and nomination processes on Clarkson's campus. This service adheres to the values of integrity, collaboration, respect, and fairness of professional fellowship advising as identified by The National Association of Fellowship Advisors (NAFA) Code of Ethics and views the major scholarship and fellowship advising experience as an integral part of the Clarkson transformative educational approach to engage the Clarkson community in promoting, participating in, and celebrating the excellence of our high-achieving students.

Undergraduate Scholarships and Financial Assistance

Financial assistance from Clarkson may consist of scholarships, grants, loans, and employment, either singly or in combination. The Office of Financial Aid distributes aid in such a way as to help the maximum number of qualified students enroll and continue in school until graduation. Students will not have the entire cost of education met by Clarkson; every student will be expected to pursue other sources of aid outside the University. Students are encouraged to explore outside scholarship opportunities through their high school guidance offices as well as Federal, State, and alternative/private educational loan opportunities.

Prospective U.S. first year students who wish to be considered for aid from Clarkson must complete the following:

1. File a completed application for admission by January 15th of the final year of secondary school
2. File the free Application for Federal Student Aid (FAFSA) by February 1st. The preferred and easiest method to apply is online at www.fafsa.ed.gov. The paper form may be available from high school guidance offices. Early Decision Plan applicants will receive appropriate applications and instructions directly from Clarkson's Admission Office.

Prospective U.S. transfer students who wish to be considered for financial aid must apply for admission to Clarkson and submit the FAFSA form. Financial aid award notices are issued to transfer students on a rolling basis beginning in early March for fall admission and in early November for spring admission.

Retention requirements for financial aid vary depending upon the source and type of aid-federal, state or institutional. Students must maintain Satisfactory Academic Program for Financial Aid. Some institutional, endowed and sponsored scholarships have a minimum GPA requirement. Most institutional scholarships are limited to 8 semesters. Responsibilities of students receiving financial assistance under provisions of one or more federal programs include an annual application (FAFSA) and maintenance of Satisfactory Academic Progress for Financial Aid as published annually in the Clarkson Regulations issued to each enrolled student. These regulations are available to prospective students upon request from the Admissions Office. Please note: Clarkson is required by federal regulations to verify specific information submitted on the FAFSA application. Federal compliance procedures require that parents and/or students submit IRS Income Tax Transcripts and W-2 forms if requested by Clarkson. The eligibility schedules for federal and New York State financial assistance can be found in the annual Clarkson Regulations.

Who receives Clarkson Awards?

At Clarkson, almost 98 percent of all undergraduates receive some form of financial assistance which includes a variety of resources including grants, scholarships, loans and work study. Over 90 percent of first year students receive awards directly from the University.

Clarkson Need Based Awards

Clarkson Grant

Substantial funds are available for students who show above-average promise for success at Clarkson.

Award amounts vary according to the financial need and academic achievement. Awards for the academic year are made during the preceding spring by the Office of Financial Aid. Students must file the FAFSA each year to be considered for Clarkson grants.

Adirondack Scholars Award

Competitive scholarships are available for students who reside in one of the following counties: Clinton, Essex, Franklin, Hamilton, Herkimer, Jefferson, Lewis, St. Lawrence, Warren, or Washington. This award is based on merit and financial need. Students are required to file the FAFSA each year to be considered and/or continue to receive this award.

Clarkson Merit Based Awards

Clarkson Scholarship

A limited number of Clarkson Scholarships are available and are based on the overall admission application including all component including high school GPA, Standardized Exam Scores, Extra-curricular activity, Recommendations, and Essays. Consideration is automatic.

Clarkson SAE Scholarship

Eight $6,000 scholarships are available to outstanding undergraduate students who plan to study engineering at Clarkson. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

Clarkson FIRST Scholarship

This award recognize select high school seniors who have participated on a FIRST Robotics (FRC) or Tech Challenge (FTC) team. Scholarships range from $1,000 - $6,000 annually. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

Five Boroughs Scholarship
This award recognizes students from the five boroughs for their hard work and commitment to academics. Recipients will receive $6,000 per year upon enrollment at Clarkson. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

Project Lead the Way
This award goes to select high school seniors who have completed three Project Lead the Way courses in their high school. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

Spirit of Innovation
This scholarship recognizes select high school seniors who have been a Spirit of Innovation participant at their high school. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

SAGE Tuition Rewards (Saving and Growth for Education)
This is a unique, private college savings program. Tuition Rewards are discounts off tuition at participating colleges that represent the minimum scholarship that an eligible student will receive if attending a member college. A student receives Tuition Rewards from multiple "sponsors" (for example, parents and grandparents). A sponsor designates the tuition rewards to the student when she/he begins her/his senior year of high school. If the student does not use the tuition rewards, they are rolled back into the sponsor's account for use by other students.

Clarkson counts Tuition Rewards as part of the normal institutional and merit scholarships. For more information on SAGE Tuition Rewards please visit https://secure.tuitionrewards.com/index.cfm.

Clarkson WACE National CO-OP Scholarship Program
Up to $6,000 per year scholarship based on academic record and scholarship application. Any major may apply. Submit the scholarship application online at https://www.waceinc.org/scholarship/index.html. Application is required. Early Decision Applications must be received by December 1 and Regular Decision Applications by January 15.

Young Entrepreneurs and Young Innovators Program
Prospective students who are selected into these programs at the Young Entrepreneurs and Innovation Business Plan Competition will receive guidance and support from faculty and alumni mentors, office space in our incubator, and will attend Clarkson without payment of tuition for their four year undergraduate career through a combination of merit-based financial aid (after accounting for other aid for which the student may be eligible) and a purchase by Clarkson of 10% equity in their firm at fair market value.

Clarkson Leadership and Achievement Award
This program annually recognizes high school juniors and community college students who demonstrate strong leadership qualities in combination with excellent academic achievement. Participating high schools and community colleges nominate one student each year for the Leadership Award. The student, upon acceptance and enrollment at Clarkson, will receive a $15,000-per-year scholarship for up to four years (total $60,000). These schools may also nominate one student each year for the Achievement Award who, upon acceptance and enrollment at Clarkson, will receive a $12,000-per-year scholarship for up to four years (total $48,000).

Tuition exchange recipients and students who receive the full tuition Clarkson employee benefit are not eligible to receive the Leadership or Achievement Awards.

Honors Program
Students of exceptional ability are accepted into the University Honors Program as entering freshmen or after their first year. All Honors students receive a scholarship as part of their Clarkson financial aid package (See Academic Program options).

Phi Theta Kappa Scholarship
For transfer students only. Amounts vary.

Alpha Beta Gamma Scholarships
For transfer students only. Amounts vary.

Alumni Connection Awards

Holcroft Alumni Recognition Awards
Awards based on strong potential for success and the recommendations from a Clarkson alumnus/ alumna. Awards are $500 per year- students can only receive one award, regardless of the number of recommendations. We suggest students contact alumni who know enough about them to provide a meaningful reference. Recommendation letters must be submitted by January 15 of the student's senior year (December 1 for Early Decision applicants).

Alumni Family Award
If you indicate on your application for admission that you have a brother, sister, aunt, uncle, or cousin who attended Clarkson, you may qualify for a $500 scholarship. Only one scholarship will be granted regardless of how many alumni family members you have.

Alumni Legacy Award
If you indicate on your application for admission that you have a mother, father, grandmother, or grandfather who attended Clarkson, you may qualify for a $1,000 Alumni Legacy Scholarship. Only one scholarship will be granted regardless of how many qualifying family members you have.

Early Decision Incentive Scholarship
An additional $8,000 scholarship is available exclusively to Early Decision applicants. The scholarship is split evenly over 4 years/8 semesters of undergraduate study ($2,000 per year/$1,000 per semester).

To qualify students must apply to Clarkson via Early Decision Admission no later than December 1 of the senior year of high school. Be a new incoming freshmen applicant. Submit the Early Decision Admission deposit within 2 weeks of receiving the Financial Aid Award Notice (extenuating circumstances will be evaluated on a case by case basis).

Heintzelman Cape Cod Scholars Program
This program is for high achieving Cape Cod, Massachusetts high school students. The program provides a $50,000 scholarship split evenly over 4 years/8 semesters ($12,500 per year) of undergraduate study at Clarkson University. An application is required.

Clarkson Visit Scholarship
Clarkson offers a $500 renewable Visit scholarship to any student who has an official undergraduate admission visit to our Potsdam, NY campus. Visits must be completed no later than January 15 of the senior year of high school.

Qualifying visits include personalized visits set up directly through the Undergraduate Admissions Office, pre-arranged overnight admission visits for accepted students, Summer Visit Day, Fall Open House, Spring Accepted Students Day, and Group Visits to campus set up directly through the Undergraduate Admissions Office.

Conrad Foundation Scholarships

The Conrad Foundation and Clarkson University have partnered together to offer 2 scholarships:

1. Conrad Foundation Spirit of Innovation Scholarship - all Conrad Challenge participants with the exception of the finalists, are awarded $12,000 per year for a total value of $48,000 over four years.
2. The Conrad Challenge Scholarship - the finalists of the Conrad Challenge receive $15,000 per year, for a total value of $60,000 over four years.

To qualify you must apply for admission and have participated in at least one year of the Conrad Challenge. You must notify us of your participation by December 15th if you are applying for early decision admission and January 15th for regular decision admission.

For the Conrad Challenge Scholarship, you must have been named a finalist in the Conrad Challenge in any year. You may only receive one scholarship regardless of the number of years you have participated.

The Conrad Foundation is a nonprofit organization dedicated to promoting collaborative, student centered, real world-relevant learning that fosters innovation and entrepreneurship.

The Conrad Challenge is an international, team-based competition for students ages 13-18 to innovate new products and services that address global issues in one of six categories.

LEWIS Income Share Agreement Program (LISA)

The LISA Program is a contract in which you receive $10,000 per year for up to 4 years while in school. You pay back the funds interest free after graduation based on your salary. A separate application is required. A limited number of spots are available each year. You must apply as a freshman. For more information please refer to the website: Lewis Income Share Agreement

New York State Tuition Assistance Program (TAP)

New York State residents may be eligible for TAP. NYS Legal Residency is required. For dependent students, parent NYS residency is also required. Awards range from $500 to $5,165 annually for up to 8 semesters. No repayment is required. Students must file a FAFSA application and an Express TAP Application (ETA) at https://www.hesc.ny.gov/ each year to be considered for assistance.

Awards are based on multiple factors including family size, number of siblings attending college in NYS and NYS taxable income. Students are notified directly by the New York Higher Education Authority Corporation (HESC) of their awards. TAP can only be credited toward tuition charges. For students who receive other tuition only scholarships or grants, the total of TAP and the other aid cannot exceed the tuition charge. TAP awards are credited to the student account after certification of full-time enrollment status and confirmation of satisfactory academic progress. The standards of satisfactory academic progress for TAP are indicated below. Satisfactory Academic Progress- Effective July 1, 2011 New York State enacted revised regulations regarding satisfactory academic progress. The regulations changed the number of credits a student must accumulate and the cumulative grade point average that must be achieved each semester.

The chart that pertains to you depends upon the year you received your first TAP award and whether or not you are a HEOP student. Please refer to the charts below:

The following chart must be used by all institutions for students who received their first TAP in 2007-2008 through and including 2009-2010 and HEOP students who received their first award in 2007-2008 and thereafter:

Calendar: Semester Program: Baccalaureate									
Program Prior being certified for this payment:									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th**	10th**
A student must have accumulated this many credits:									
0	3	9	21	33	45	60	75	90	105
With at least this grade point average:									
0	1.1	1.2	1.3	2.0	2.0	2.0	2.0	2.0	2.0

The following chart must be used by all 4 year institutions for students (excluding HEOP) who received their first TAP award in 2010-2011 and thereafter:

Calendar: Semester Program: Baccalaureate									
Program Prior being certified for this payment:									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th**	10th**
A student must have accumulated this many credits:									
0	6	15	27	39	51	66	81	96	111
With at least this grade point average:									
0	1.5	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0

Other NYS Scholarships

New York State offers other scholarships in addition to TAP. Visit www.hesc.ny.gov for more information.

State Scholarships

New Jersey, Pennsylvania, Rhode Island, Vermont, and many other states have state-sponsored scholarship programs which can be used at Clarkson. It is suggested students contact their high school guidance office or state education department for information on state scholarships.

NYS Aid to Native Americans

A member of any Native American tribe within New York State may be awarded $2,000 annually for a maximum of four years of full-time study. State aid to Native Americans is an entitlement program. There is neither a qualifying examination nor a limited number of awards. Application forms may be obtained from the Native American Education Unit, New York State Education Department, Albany, New York 12234.

Pell Grants

Eligibility for the federal Pell Grant is determined by the Department of Education based on the information provided on the FAFSA. Students must submit a FAFSA each academic year. Award amounts are set annually by the federal government. Pell Grants do not need to be repaid.

Supplemental Educational Opportunity Grant (SEOG)

This is a non-repayable federal grant, administered by the University and awarded to Pell Grant recipients. Students must submit a FAFSA each academic year. Awards are contingent based upon financial need and the availability of federal funding. Awards typically range from $300-$600 annually.

Federal Work-Study Program

Federal Work-Study is awarded to eligible students based on the information submitted on the FAFSA. Students are given the opportunity to work at various sites on campus. The amount each work-study student may earn is predetermined by the Office of Financial Aid. The student works a specific number of hours each week during the semester to earn that amount. Students are included in the University payroll system and receive a bi-weekly paycheck. Work-study money is allocated to the University by the federal government and jobs are contingent upon funding.

Veterans Scholarship Program

The Veterans Readjustment Benefits Act of 1966 enables veterans to obtain financial aid for a college education. To be eligible, a veteran must have been released from the service since January 31, 1955, and have served more than 181 days. Information and applications are available at the local Veterans Administration Office.

Clarkson provides funds for highly competitive academic awards made annually to Army and Air Force veterans who have been separated from the service for less than a year. The scholarships provide up to full tuition until completion of the degree program.

Air Force Reserve Officers' Training Corps (ROTC) Scholarships

Merit-based tuition scholarships are available to Air Force ROTC cadets ranging from $3,000 to full tuition and fees. Below is the list of current scholarships:

1. Type I : Tuition and mandatory fees for a full-time student
2. Type II : $18,000 towards tuition
3. Type III : $9,000 towards tuition
4. Type VI: $3,000 towards tuition
5. Type VIII: Competitive-based academic upgrade of a Type II, pays up to 80% of tuition and fees

Type I, II, III, and VIII include a book allowance of $300 per semester, a monthly tax free stipend of: Freshman-$300, Sophomore-$350, Junior-$450, and Senior-$500 and the Clarkson ROTC Incentive Scholarship (See below).

Army Reserve Officers' Training Corps (ROTC) Scholarships

Army ROTC Scholarship winners receive the tuition and mandatory fees benefit.. Winners will also receive a book allowance of $1,200 per year and a tax-fee stipend of $300-$500 per month for 10 months. All Army ROTC Scholarship winners are eligible to receive the Clarkson ROTC Incentive Scholarship.

Clarkson ROTC Incentive Scholarship (Army and Air Force)

Eligible ROTC Scholarship recipients may receive the Clarkson ROTC Incentive Scholarship. This scholarship is valued at the average cost of room and board for an academic year. Proceeds from the Clarkson ROTC Incentive Scholarship may only be used for housing and meal expenses.

VA Yellow Ribbon Program

Beginning in August 2009, Clarkson has been approved as a participant in the VA Yellow Ribbon Program. The Post 9/11 Veterans Educational Assistance Act provides partial tuition and fee benefits to eligible active duty, veterans and eligible dependents. As a Yellow Ribbon school, Clarkson will contribute 50% of the remaining cost of tuition and fees. The Department of Veterans Affairs will match this amount. In partnership with the Department of Veterans Affairs, Clarkson will ensure that the full cost of tuition and fees will be covered at a rate of 100%.

In accordance with Title 38 US Code 3679 subsection (e), Clarkson University adopts the following additional provisions for any students using U.S. Department of Veterans Affairs (VA) Post 9/11 G.I. Bill (Ch. 33) or Vocational Rehabilitation and Employment (Ch. 31) benefits, while payment to the institution is pending from the VA. Clarkson will not:

- Prevent, nor delay the student's enrollment;
- Assess a late penalty fee to the student;
- Require the student to secure alternative or additional funding;
- Deny the student access to any resources available to other students who have satisfied their tuition and fee bills to the institution, including but not limited to access to classes, libraries, or other institutional facilities.

However, to qualify for this provision, such students are required to provide a Certificate of Eligibility to the School Certifying Official no later than the first day of class.

Part-Time Student Employment at Clarkson

Each year various departments and offices on campus employ students who do not qualify for federal work study. Students may interview as the jobs become available. Student Administrative Services is able to assist interested students find employment at the University.

Lewis Income Share Agreement Program (LISA)

Clarkson offers a limited number of income share agreements to new incoming students. This is an interest free alternative to traditional financing. In exchange for a percentage of their income after graduation, participants will pay Clarkson University a percentage of their income over a fixed number of years. The maximum amount a student can receive is $10,000 per year ($5,000 per semester) and is renewable each

year for 4 years of full time undergraduate study at Clarkson. More information can be found at https://www.clarkson.edu/isa

Clarkson Payment Plan (PP)

Clarkson provides a 12-month payment plan, an option attractive to many families. Participation in the PP is extended to anyone with a U.S. address. The applicant determines the amount to be financed; the maximum amount is the total charges less estimated financial aid, and the minimum amount is $1,000 a semester. The PP is available with no finance or interest charges, provided payments are made in accordance with the terms of the contract.

Detailed information regarding the PP and applications are available from Student Administrative Services, Clarkson University, Box 5548, Potsdam, NY 13699-5548; 315-268-6451 or at https://intranet.clarkson.edu/student-life/sas/forms/.

Clarkson Endowed, Sponsored, and Share Clarkson Scholarships

Various individuals, foundations and corporations have donated funds to establish scholarships for Clarkson students who meet certain criteria. Endowed scholarships provide assistance to students in perpetuity. Sponsored scholarships provide assistance on an annual basis. In general, these awards are made to incoming new students who show academic promise and leadership potential as well as continuing upper-class students who maintain exceptional cumulative grade point averages and meet other specific criteria. Recipients are selected by the Office of Financial Aid Scholarship Committee. Students are notified of the award by the financial aid package notification process (paper award letter for new students; on-line for continuing students) and amounts are credited to the student's account each semester.

Generally, students retain the award for the remainder of their undergraduate career at Clarkson to the extent of a four-year period, provided academic and financial aid satisfactory academic progress standards are maintained. Some scholarships have higher minimum GPA requirements. Scholarships established through the generosity of Clarkson benefactors are awarded with the understanding that there is a moral obligation for the student to repay the funds received. By accepting the grant award, the student accepts the moral responsibility to contribute to Clarkson when financially able to do so. By fulfilling this moral obligation, the student will help replenish the grant fund ensuring Clarkson will be able to offer institutional aid to future students. A list of endowed and sponsored scholarships follows:

Endowed Scholarships

Advani Endowed Scholarship Fund Ackermann
The Arthur, Dora and JoAnn L. Armani Endowed Scholarship Fund
Frank and Lee Augsbury Endowed Scholarship Fund
Azote Inc. Endowed Scholarship Fund
Gordon W. Babcock '46 Endowed Scholarship Fund

Edward J. Barno ’77 Endowed Scholarship Fund
The Gordon C. "Stub" Baker ’27 Endowed Scholarship Fund
Raymond and Esther Baker Endowed Scholarship Fund
The Arnold and Helen Barben Endowed Scholarship Fund The
H. Douglas and Sara Barclay Endowed Scholarship Fund
Professor Robert Barr Endowment Scholarship
Charles E. Becker Memorial Scholarship Fund
John J. Bero, Sr. Memorial Scholarship Fund
Robert and Elaine Birrell Endowed Scholarship
Joseph I Bishop ’61 Endowed Scholarship
Bart Blaner '83 Endowed Scholarship
Professor Owen E. Brady III Endowed Scholarship
Andrea K. Bridge ’68 and John E. O’Beirne Endowed Presidential Scholarship Fund Bradford Broughton Technical Communications Endowed Scholarship Fund
Robert Brunner, Jr. '83 Memorial Endowed Scholarship Fund
William G. Brown '37 Memorial Endowed Scholarship Fund
Ernest and Evelyn Bulriss Endowed Scholarship
A. Douglas Burrow ’31 Endowed Scholarship
Purcell J. and Edith O. Brownell Endowed Scholarship Fund Cala Family Endowed Scholarship Fund
Janice L. Campbell Endowed Scholarship Fund
Robert '61 and Cynthia Campbell Hockey Endowment Scholarship Fund Robert W. Carroll Jr. ’63 Graduate Endowed Scholarship Fund
Robert W. Carroll Jr. ’63 Undergraduate Endowed Scholarship Fund James D. Cartin Memorial Scholarship Fund
Castrinovo Endowed Scholarship
Tony /54 and Carol Cecere Endowed Scholarship
Brian Y. Changlai MD, PhD '70, Mary C. Daye MD '71 and Brian A. Changlai MD Endowed Scholarship Fund
John D. and Helen Chapple Endowed Scholarship Fund
Siren R. Chudgar, MD ’96 and Jennifer L. Chudgar Endowed Scholarship Fund Edwin C. Clark Memorial Scholarship Fund
Clarkson University General Scholarship Fund
Clarkson University Memorial Scholarship Fund
Clarkson University Parents Endowed Scholarship Fund
Class of 1947 Endowed Scholarship Fund Class of 1963 Endowed Scholarship Fund
Frederick W. Cleveland North Country Merit Scholarship Fund
Thomas F. Clough ’62 Endowed Presidential Achievement Scholarship Fund
Doug and Jane Collette Endowed Scholarship Fund Wallace H. Coulter Endowed Scholarship
Wendall O. Covell Scholarship Fund

Kristin Bandy Craig Memorial Scholarship Fund
The Crane Family Endowed Scholarship Fund
Cristo Endowed Scholarship
Clarkson University Pep Band Alumni Association Endowed Scholarship
Ralph S. Damon Endowed Scholarship Fund David E. Davies ’77 Endowed Scholarship Fund
DeCrescenzo-Lupe Endowed Scholarship
Deneka Family Endowed Scholarship Fund
The Development Authority of the North Country (DANC) Endowed Scholarship Fund R. David Diederich ’64 Memorial Endowed Scholarship
Benson G. Diefendorf Endowed Scholarship Fund
Louis ’54 and Joan Dino Endowed Scholarship
James L. Dohr Accounting Scholarship Fund Dolphin Legacy Endowed Scholarship
Brendan Donohue ’84 Memorial Endowed Scholarship Fund
Richard C. ’55 and Joy M. Dorf Endowed Scholarship Fund
Glendon '79 and Margaret Duclos Endowed Scholarship
John M. ’59 and Joyce A. Eikenberg Endowed Scholarship Fund
Dave ’69 M’75 and Debi Elkins Scholarship Endowed Fund
Arthur ’47 and Dorothy Engle Distinguished Scholarship Fund
Emerson Foundation Matching Grant for Endowed Presidential Scholarships Allen ’44 and Kathleen Fales Endowed Scholarship
Famigghia Castronovo/Carrington Endowed Scholarship
Daniel P. Fellegara ’06 Memorial Endowed Scholarship
James E. Fassett Endowed Scholarship Fund
The Samuel B. Feitelberg Physical Therapy Fellowship Endowed Scholarship
Alan T. Finn '87 Memorial Endowed Scholarship
Joan and Barry S. Fischer ’54 School of Business Endowed Scholarship Fund
Barry S. Fischer ’54 Endowed Scholarship Fund
Ferris Fayette Flint Electrical Scholarship Fund
George Floyd Memorial Scholarship
John F. Frazier ’38 & L.K. Sillcox Endowed Scholarship
J. Ronald Frazer ’45 Endowed Fellowship
Stig E. Friberg Undergraduate Research Endowment Award
Walter Fuss ’51 Endowed Scholarship for Civil Engineering
Phil Garda ’67 Memorial Endowed Scholarship Fund
Nelson Gibbs '59 Endowed Scholarship
Alan W. Gibney ’69 Endowed Scholarship Fund
FLIR Systems, Inc. Endowed Scholarship Fund
Fred and Betsy Garry Endowed Scholarship Fund

William B. Gero Memorial Scholarship Fund
Alan W. Gibney ’69 Endowed Scholarship
Christopher W. Gilmore ’88 Memorial Endowed Scholarship
The Ruth and Sandy ’54 Ginsberg Endowed Scholarship Fund
Giromini Family Endowed Scholarship
The Joel ’57 and Lynda Goldschein Endowed Scholarship Fund
Frank C. Goodrich Memorial Endowed Scholarship Fund
George A. Gray Endowed Fellowship Fund
Karl A. Greenhagle '69 Endowed Scholarship Fund
Anna and Frank Greenwall Scholarship Fund
Frank E. Gutmann Memorial Scholarship Fund
Margaret Van Hamlin Haddad Scholarship Fund
Steven W. ’68 and Laurie Hafener Endowed Scholarship Fund
David L. Hall ’65, ’68 Memorial Endowed Scholarship
Erwin C. ’48 and Jeanne Hamm Scholarship Fund
Hammam Endowed Scholarship Terry O. Harden ’76 Memorial Scholarship Fund
Frank M. Hardiman Scholarship Fund
Harrison-Campbell Endowed Scholarship Fund
The Lynn P. Harrison, III and Tonya P. Harrison Endowed Scholarship Fund
William P. Harrison Endowed Scholarship Fund
Blayne Hartman '75 Endowed Scholarship
Ralph E. ’55 and Solita Hawes Endowed Scholarship Fund
David ’83 and Sheryl Heacock Endowed Scholarship for Engineering and Management
Charles W. Hearl ’51 Endowed Scholarship Fund
Steven Hearl ’80 Endowed Scholarship for Civil and Environmental Engineering
William Randolph Hearst Endowed Scholarship Fund
Richard Hemphill '67 Endowed Scholarship
Ellen Herrick Endowed Scholarship Fund
Barbara Hewett Lowers Endowed Scholarship
Mildred Dear Hill and Robert R. Hill ’48 Endowed Scholarship
George O. and Clara E. Hodge Endowed Scholarship Fund
Bruce ’69 and Suzanne Hoffman Endowed Scholarship
David L. ’75 and SaraAnne Baker Hopkins Endowed Scholarship
Harry and Florence P. Hull and Katherine Hull Endowed Scholarship Fund
William ’61 and Elaine Hurd Endowed Scholarship Fund
Albert C. and Ella W. Hyde Endowed Scholarship
Michael Lewis Jaeger Memorial Endowed Scholarship
Clarke H. Joy ’29 Memorial Endowed Scholarship
Sol Kaplan Scholarship Fund/ The Kardan Scholarship Fund
Peter A. Klein ’87 Memorial Endowed Scholarship
The Gary F. Kelly Endowed Scholarship Fund
Kent Family Endowed Scholarship
Kenyon Endowed Scholarship
Kretis Family Endowed Scholarship

Lally Endowed Scholarship
William H. ’53 and Beverly Lane Endowed Scholarship Fund
William H. Lane Incorporated Endowed Scholarship Fund
Earl L. LaPointe ’22 Memorial Scholarship Fund
Sylvain L. Larose '75 Endowed Hockey Scholarship Fund
Kristine M. Layn Endowed Scholarship Fund
The Howard E. ’48 and Mary Lou Lechler Endowed Scholarship
Cecile and Herman Lieberman Endowed Scholarship Fund
Joseph ’82 and Rachel Loo Endowed Scholarship
Barbara Hewett Lowers Endowed Scholarship Fund
The Norman ’51 and Pat Maggione Endowed Scholarship
Jason Marsden ’91 Endowed Scholarship
Egon Matijevic´ Endowed Chemistry Scholarship Fund
Peter M. Mayo ’71 Endowed Scholarship
Theodore Sr. and Wanda McWharf Endowed Scholarship
Arthur, Eleanor and Jack Mietz Endowed Scholarship Fund
Gus’82 and Magda Mininberg Endowed Scholarship
Charles T. Mosier ’72 Memorial Endowed Scholarship Fund
Steve Neely Endowed Memorial Scholarship Fund
Nelson Endowed Scholarship
Theodore ’56 and Priscilla Nelson Endowed Honors Scholarship
J. Paul Nessler ’69 Memorial Endowed Scholarship Fund
The Ronald R. "Monk" Neugold ’52 Endowed Scholarship Fund
The Newell Family Endowed Scholarships
Edgar A. Newell Endowed Scholarship Fund
Jean S. Newell Society of Women Engineers Endowed Scholarship Fund
W. Allan Newell Endowed Scholarship Fund
New York State Federation of Home Bureaus (St. Lawrence County) Scholarship Fund
New York State Federation of Home Bureaus (Louise Villeneuve McMahon) Scholarship Fund
Newkofsky Endowed Scholarship
Lisa Niles ’78 Memorial Endowed Scholarship
Nathan and Janet Owen Endowed Scholarship Fund
Anthony J. Palumbo '60, and Phyllis A. Palumbo Chemical Engineering Endowed Scholarship Fund
James P. Papayanakos Scholarship
Kenneth R. and Margaret K. Parker Endowed Scholarship Fund
Matt and Prue Pecorella Endowed Scholarship
Sara Snell Petersen/W. Hollis Petersen Endowed Scholarship Fund
The Dick Pratt Endowed Prize Fund (PEP Fund) established by Phyllis A. Palumbo and Anthony J. Palumbo, M.D. (1960), and Family
Ledyard H. Pfund ’40 Presidential Achievement Award Scholarship Fund
Leo ’25 and Gertrude Ploof Endowed Scholarship Fund
Harold A. and Dorothy Putnam Endowed Scholarship Fund

Peter Radding ’63 Memorial Endowed Scholarship
George H. Randall ’16 and Paul W. Randall ’92 Endowed Scholarship Fund
Stephen C. Redding ’63 Memorial Scholarship Fund
Kyle G. Reichley ’85 Memorial Endowed Scholarship
Gerald ’58 and Judith Reinman Endowed Scholarship Fund
Relyea Endowed Chemistry Scholarship
Relyea Endowed Engineering Scholarship
The Ernest ’42 and Constance Richmond Memorial Endowed Scholarship Fund
Ridings Family Endowed Scholarship Fund
Robbins "I Pay it Forward" Endowed Scholarship
Elwyn J. Rodee Endowed Scholarship Fund
Paul Rodgers Memorial Endowed Scholarship
William J. Rowley Endowed Scholarship Fund
Sackett Endowed Scholarship
Willard G. '53 and Barbara B. Shafer Endowed Scholarship
Francis E. ’63 and Mona K. Sage Endowed Scholarship Fund
Sapia '58 Endowed Scholarship
Albert L. and Mary S. Sayer Endowed Scholarship Fund
Joseph Scaturro Endowed Scholarship Fund
Fred Schoenhut '78 Endowed Scholarship Fund for Hockey Ralph and Jessie Scott Endowed Scholarship Fund
Thomas ’70 and Gayle Sette Scholarship Endowment
Willard G. ’53 and Barbara B Shafer Endowed Scholarship Fund
Shelly Electric Endowed Scholarship Fund
Thomas E. Simpkins '30 Endowed Scholarship Fund
John and Verna Sherrick Endowed Scholarship
William ’70 and Sandra Shusda Endowed Scholarship
F. Carlton and Ethel B. Simpson Endowed Memorial Scholarship Fund
Sisson Family Endowed Scholarship Fund
Jay P. Smee ’52 Endowed Scholarship Fund
Barry P. Smith ’65 Endowed Scholarship Fund
James T. and Grace B. Smith Endowed Scholarship Fund
William D. ’54 and Shirley Smith Endowed Scholarship Fund
John Ben Snow Foundation Endowed Scholarship
George J. Stanley Endowed Scholarship Fund
Bill ’64 and Sherrie Taylor Endowed Scholarship
Charles Thomas ’63 Adirondack Endowed Scholarship
The Thompson Family Endowed Scholarship Fund
Tilling Endowed Scholarship
Fay ’62 & Nadine Tolman Endowed Scholarship Fund
Mel Tomalty '61 Endowed Scholarship
Toole-O'Donnell Families and MVW Endowed Scholarship Fund
Earle E. Towlson ’27 Memorial Endowed Scholarship Fund
Donna and Steve Tritman '68 Endowed Scholarship

Tubbs Family Endowment
Edward F. Tucker Endowed Scholarship Fund
Merton Van Sant/Industrial Development Agency Endowed Scholarship Fund
David A. Walsh ’67 Endowed Scholarship Fund
Melissa A. Walsh ’03, ’05 Memorial Endowed Scholarship
Mr. and Mrs. Robert N. Wagner Scholarship Fund
The Dr. John ’73 and Roberta Wasenko and Family School of Engineering Endowed Scholarship Fund
The Dr. John ’73 and Roberta Wasenko and Family Health Sciences Endowed Scholarship Fund
John ’52 and Jane Ward Endowed Scholarship
Weimer Endowed Scholarship
Dr. Mark W. and Beulah Welch Endowed Scholarship Fund
John “Jack” S. ’54 and Norma Welch Memorial Endowed Scholarship
Richard and Gina Weniger Memorial Endowed Scholarship
J.R. Weston Endowed Scholarship Fund
Stanley '57 and Viola Wetreich Endowed Scholarship
Carol Wicks '80 Endowed Scholarship
Allen '63 and Barbara Winegard Endowed Scholarship
James P. Witkowski Endowed Scholarship
Nancy E. and James E. Wood ’64 Endowed Scholarship Fund
MK Woods ’82 Endowed Scholarship Fund
Clarence F. Wright Endowed Memorial Scholarship Fund
Eugene R. Yeager Jr. ’75 Memorial Scholarship Fund
Yentzer Endowed Scholarship Fund
Terry Yurkiewicz ’66 Memorial Hockey Endowed
Zieger Endowed Scholarship Fund
Zuman Award in Chemistry

Sponsored Scholarships
AAA Ehrlich Sponsored Scholarship
Kenneth R. Baker Family Engineering Sponsored Scholarship
Barrett Paving CEM Sponsored Scholarship
Bechtel Foundation Sponsored Scholarship
Boothill Stepping Stone Scholarship
Buyers Sponsored Scholarship
Donald Clark Sponsored Scholarship
Clarkson Club Sponsored Scholarship
Clarkson University General Sponsored Scholarship
Colden Corporation Sponsored Scholarship
James A. Comstock Memorial Sponsored Scholarship
Bill Cotter ’73 Sponsored Scholarship
Kristin Bandy Craig Memorial Sponsored Scholarship
Crane Fund for Women and Children Sponsored Scholarship

DDS Companies Sponsored Scholarship
Delta Upsilon Sponsored Scholarship
Daniel P. Fellegara '06 Memorial Sponsored Scholarship
Elkins Sponsored Scholarship
The Brothers of Delta Tau Tau Scholarship in memory of Michael Fahrenkopf ‘11
Stig E. Friberg Award for Undergraduate Research
Sponsored Scholarship Giromini Family
Glens Falls Contractors Association Sponsored Scholarship
Kenyon Sponsored Scholarship
NewPage Corporation Sponsored Scholarship
Edwin E. Hatch Foundation Sponsored Scholarship
Honors Program Sponsored Scholarship
Hurd Sponsored Scholarship
Ralph A. Janaro Memorial Sponsored Scholarship
Lally Sponsored Scholarship
Michael Lewis Jaeger Memorial Sponsored Scholarship
Andrew Joseph Jankowiak Sponsored Scholarship
Kathleen Kafka and Reed Phillips Memorial Sponsored Scholarship
Key Bank Sponsored Scholarship
Krigman '63 MME Undergraduate Research Grant Fund Sponsored Scholarship
Joel Lerich '62 Memorial Sponsored Scholarship
Stuart Lott '70 Sponsored Scholarship
Edward T. Misiaszek Sponsored Scholarship
Miss New York of the North Country Sponsored Scholarship
National Starch & Chemical Company Sponsored Scholarship Steve Neely Memorial Sponsored Scholarship
North Country Friends Sponsored Scholarship
O'Brien & Gere Sponsored Scholarship
Karen Mazzella Olmstead ’84 Memorial Sponsored Scholarship
N I Rea Sponsored Scholarship
Gerald '58 and Judith Reinman Sponsored Scholarship
Ruston Paving Company CEM Sponsored Scholarship
Sage Scholars North Country Scholarship
David Scaringe '01 Memorial Sponsored Scholarship
Todd Stanley Searfoss '79 Memorial Sponsored Scholarship
Sprout Foundation Sponsored Scholarship
Sprout Foundation Sponsored Scholarship #2
Stantec Consulting Services Incorporated Sponsored Scholarship
James P. Witkowski Sponsored Scholarship
Norman Westerman Thurston '63 Sponsored Scholarship
Wildwood Foundation Sponsored Scholarship
Wyeth-Ayerst Sponsored Scholarship

Share Clarkson Direct Scholarships

Gilbert and Ruth Adams Class of 2017 Share Clarkson Direct Scholarship
Gordon Boncke '47 Class of 2016 Share Clarkson Direct Scholarship
Bruce G. Boncke ’71 Class of 2019 Share Clarkson Direct Scholarship
David William ’88 and Kristina Art Buchwald Share Clarkson Scholarship
Bouchard/Mountjoy Class of 2013 and 2018 Share Clarkson Direct Scholarship
Amy Castronova '04 Class of 2014 and 2019 Share Clarkson Direct Scholarship
Cecere Share Clarkson Scholarship
Bill ’73 and Carol Cotter Share Clarkson Scholarship
James M. Coughlin ’53 Share Clarkson Direct Scholarship
Richard J. Creek '66 Share Clarkson Class of 2023
Sean '89 and Lori '89 Donohoe class of 2013 and 2018 Share Clarkson Direct Scholarship
Richard Dwyer '77 Share Clarkson Scholarship 2023
William V. ’83 and Susan Fiacco Share Clarkson Scholarship
Richard Fiesinger ’67, M’68 Share Clarkson Scholarship
Goldman Class of 2013 Share Clarkson Direct Scholarship
Joel '57 and Lynda Goldschein Class of 2014 and 2018 Share Clarkson Direct Scholarship
Fred ’61 and Selma Goldstein Share Clarkson Scholarship
Jim Greenfield ’64 M’66 Share Clarkson Scholarship
Elinore and Beecher '50 Greenman Classes of 2014, 2015, 2016, 2017 and 2018 Share Clarkson Direct Scholarship
Rosemary A. Harrington Class of 2015 Share Clarkson Direct Scholarship
W. Jon Harrington Class of 2015 Share Clarkson Direct Scholarship
M. Hubbard Construction, Inc. Classes of 2013 and 2016 Share Direct Clarkson Scholarship
Jacobsen Family Share Clarkson Scholarship in Honor of Robert Jacobsen '66
Jolyn Foundation Class of 2013, 2014 and 2018 Share Clarkson Direct Scholarship
Gerald ’61 and Mary Kilanoski Share Clarkson Scholarship
Donald B. Kloeber '71 Class of 2023 Share Clarskon Scholarship
Matthew J. Maslyn '77 Class of 2015 Share Clarkson Direct Scholarship
Northern Lights Share Clarkson Scholarship
Francis ’85 and Christine Peverly Family Share Clarkson Scholarship
David D. Reh '62 Classes of 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 Share
Clarkson Direct Scholarship
Reinman Share Clarkson Scholarship
George Schreiber '64 Share Clarkson 2023
John and Verna Sherrick Class of 2013 and 2018 Share Clarkson Direct Scholarship
Richard ’60 and Nancy Siewert, P’ 95 Share Clarkson Scholarship
Robert '74 and Julia Storms Class of 2015 and 2018 Share Clarkson Direct
Frederick W. Swanton Jr. ’68 Share Clarkson Scholarship
Scholarship Structural Associates, Inc. Class of 2013 Share Clarkson Direct Scholarship

Alissa, Donna and Steven M. '68 Tritman Class of 2017 and 2023 Share Clarkson Direct Scholarship
Susan J. and Ellsworth F. '65 Vines Class of 2015 Share Clarkson Direct Scholarship
Rita Fadale Wagner Class of 2013 Share Clarkson Direct Scholarship
David A. Walsh '67 Class of 2023 Share Clarkson Scholarship
In Honor of Katherine H. Wears Class of 2019 Share Clarkson Direct Scholarship
Wolfley Family Share Clarkson Direct Scholarship

Prize Funds
Gregory P. Arnold ’73 Memorial Award
Jerome D. Barnum Memorial Prize
Randy Brockway ’91 Memorial Award
Stephen Brunauer Memorial Award
Charles M. Clark Memorial Award Frederica Clarkson Prize
Levinius Clarkson Prize
Vern Clute Memorial Academic Achievement
William Coleman Memorial Prize
Francis Deneen Prize
William Farrisee Memorial Award
Doc Jones Prize
Elizabeth A. Kissel ’90 Memorial Award
Richard Brady Legro ’82 Memorial Award
Albert Merrill ’13 Faculty Prize
Dr. Carl Michel Prize
Fran Neragin Prize
Perkins Family Memorial Award
Kyle G. Reichley ’85 Memorial Award for Excellence in Management
Shirley Rogers Memorial Award
Robert E. Rosati ’52 Award for Excellence in Mechanical Engineering
John B. Russell Memorial Prize
Ilse J. Shaw Award
R. Shankar Subramanian ’69 Prize for Outstanding Scholarly Achievement in Chemical Engineering
Martin A. Welt ’54 Family Awards

Endowed and Sponsored Prizes and Awards
Clarkson bestows prizes and awards, both monetary and nonmonetary, upon deserving Clarkson students in recognition of their outstanding contributions to the academic, athletic and extracurricular life of the institution. Amounts are credited to the student’s account.

List of prizes awards follows:

Raymond R. Andrews Achievement Award
Gregory P. Arnold ’73 Memorial Endowed Prize
The Cathy Avadikian and David Wells Award in Engineering and Management
Jerome D. Barnum Memorial Award
Randy Brockway ’91 Memorial Award
Stephen Brunauer Memorial Award for Excellence in Chemistry CEE Junior Faculty Endowed Prize Fund
Charles Martin Clark Award
Clarkson Alumni Frederica Clarkson Award
Clarkson Alumni Levinus Clarkson Award
Vern Clute Memorial Academic Achievement Award
Communication & Media Sophomore Award
Communication & Media Junior Award
Communication & Media Senior Award
Major William Coleman Award
Francis DeLucia '66 Endowed Prize Fund Digital
Arts & Sciences Sophomore Award
Digital Arts & Sciences Junior or Rising Senior Award
Francis Dineen Award
The Dean William J. Farrisee Memorial Award
John W. Graham Jr. Leadership Award
George A. Gray Endowed Fellowship
Doc Jones Prize Fund
Elizabeth A. Kissel ’90 Endowed Memorial Award
The John H. Koerner, Jr. ’76 Intramural Award
The John H. Koerner, Jr. ’76 Memorial Award
The Martin M. Koshar ’55 Endowed Prize
Richard Brady Legro ’82 Memorial Award
Albert D. Merrill ’13 Endowed Faculty Prize
Dr. Carl Michel Award
Mike Morrison ’89 Memorial Coaches Award
Fran Neragin Award
Perkins Family Memorial Award
Dick Pratt Endowed Prize Fund
The Norman L. Rea Award
Kyle G. Reichey ’85 Memorial Alumni Award for Excellence in Business Intelligence and Data Analytics
The Shirley Rogers Residence Hall Advisor Award
Robert E. Rosati ’52 Award for Excellence in Mechanical Engineering
Keith M. Russ Memorial Award
John B. Russell Memorial Prize
Ilse J. Shaw School of Management Freshman Award
Ilse J. Shaw School of Management Sophomore Award

Sigurds Arajs Memorial Award STAFDA Outstanding Junior Award
STAFDA Outstanding Senior Award
Arthur L. Straub Memorial Award
R. Shankar Subramanian Prize for Outstanding Scholarly Achievement in Chemical Engineering
The Peter ’90 and Chandra Wargo Digital Arts & Sciences Award
Arthur J. Wells Prize
Martin A. Welt ’54 Family Awards Loans

William D. Ford Federal Direct Loan

Federal Direct Loans including both subsidized and unsubsidized loans, are low-interest loans funded by the federal government. Maximum annual borrowing limits are: First-year students, $5,500; sophomores, $6,500; juniors and seniors, $7,500. Aggregate loan totals for combined subsidized and unsubsidized loans cannot exceed $31,000 for dependent undergraduates and $57,500 for independent undergraduates. Aggregate loan limits for subsidized loans for all undergraduate students may not exceed $23,000.

Clarkson Loan Funds

Clarkson has 23 separate loan funds from which students may borrow up to $4,000 in any semester, subject to availability and borrower qualification. These loans are available through Student Administrative Services. Repayment begins nine months after a student’s enrollment at Clarkson terminates. A list of loan funds follows:

Frederick E. Anderson Memorial Loan Fund
The Arnold and Helen Barben Scholarship Incentive Loan Fund
Beazer East Loan Fund
Clarkson University Memorial Loan Fund
ABB Combustion Engineering Scholarship Incentive Loan Fund
Arthur Vining Davis Scholarship Incentive Loan Fund
Decker/Dulude/Corning Scholars Program
Demeree-Toohey Scholarship Incentive Loan Fund
Charles A. Frueauff Scholarship Incentive Loan Fund
Kent Family Endowed Scholarship Fund
John H. Koerner, Jr., Loan Fund
Robert and Jane LaHair Scholarship Incentive Loan Fund
Lambda Phi Epsilon Student Loan Fund
Theodore Sr. and Wanda McWharf Endowed Scholarship Fund
George O. Miles Memorial Loan Fund
National Grid Scholarship Incentive Loan Fund
North Country Friends Loan Fund
Alan D. Nolet '78 Scholarship Incentive Loan Fund
The William S. Prescott Memorial Incentive Loan Fund
Procter & Gamble Chemical Engineering Loan Fund

Elwood (Pete) Quesada Scholarship Incentive Loan Fund
N. L. and Eleanor Rea Student Loan Fund
George E. Snyder Memorial Loan Fund
Water E. Turnbull Memorial Scholarship Incentive Loan Fund Arthur
O. and Louella K. West Memorial Loan Fund

Satisfactory Academic Progress for Federal and Institutional Financial Aid

The US Department of Education has issued Satisfactory Academic Progress (SAP) requirements effective July 1, 2011. These requirements are part of the Program Integrity and Final Regulations issued on October 29, 2010.

The revised Satisfactory Academic Progress (SAP) policy that follows includes the requirements of the Program Integrity Regulations and is effective at the beginning of the Fall 2011 term. Revisions to this policy were made on March 13, 2020 and are effective with the SAP evaluation that will be conducted at the end of the Spring 2020 semester and moving forward.

Federal regulations requires institutions to evaluate Financial Aid SAP at the end of the fall, spring, and summer terms. Both full-time and part-time enrollment status must be evaluated as well as periods of enrollment during which the student did not receive financial aid. All students are encouraged to become familiar with the policy as eligibility for federal and institutional aid may be an important factory in being able to continue one's education at Clarkson. Students must maintain SAP to retain eligibility for federal and institutional financial aid. SAP is comprised of three areas as required by federal regulations. A student must complete their degree within a specified period, demonstrate PACE by earning a minimum percentage of attempted credit hours and maintain a cumulative GPA that is consistent with meeting graduation requirements. Some institutional scholarships (i.e. Honors, Endowed and Sponsored Scholarships) may require higher academic achievement than the standards outlined in this section. Students with questions regarding specific scholarships are advised to contact their Student Achievement Specialist.

Satisfactory Academic Progress Standards for Financial Aid are based on a student's cumulative record and are separate from Academic Standing determinations. A student who is on academic warning, academic probation, or has been approved to continue after separation retains financial aid eligibility provided the Satisfactory Academic Progress Standards for Financial Aid (detailed below) are met.

1. Maximum Time Frame for Degree Completion
    a. Federal Regulations specify that a student must complete his/ her degree within 150% of the published length of the program. The maximum time frame at Clarkson is measured in attempted hours. A student must earn 120 credits to receive a Bachelor's degree. Therefore, to retain financial aid eligibility, the maximum time frame to complete the program for full time

students cannot exceed 180 attempted credit hours, 6 years, or 12 terms, whichever comes first.

b. A part-time student cannot exceed 180 attempted credit hours. A student pursuing a second Bachelor's degree with the first Bachelor's degree must complete the additional required coursework within the 150% time frame period. Effective March 13, 2020 for the SAP evaluation period that will occur at the end of the Spring 2020 semester and going forward, a student may appeal the Maximum Time Frame requirement based on extenuating circumstances.

c. Credits counted in the maximum time are all attempted credits and include:
    i. Earned hours - Passed (A-D), Pass (P)
    ii. Repeated courses - All attempts (see repeated course section below)
    iii. Withdrawal - Maximum time frame regulations do not allow for the exclusion of courses in which a student has remained past the drop period and earned a grade of "W"
    iv. Failure - F
    v. Incomplete - I
    vi. All accepted transfer - T
    vii. All courses attempted at Clarkson, even if they are not used to meet degree requirements.

2. Pace Standards PACE is defined by federal regulations as steady progress towards degree completion within the 150% time frame. Clarkson is required to measure a student's PACE as a percentage as indicated below:
    a. A minimum percentage of attempted credit hours must be earned every semester
        i. Cumulative number of earned hours
        ii. Cumulative number of attempted hours
    b. Earned credit hours for PACE:
        i. Grades of A, B, C, D or P (with credit)
        ii. All accepted transfer credits and (including consortium agreements & Study Abroad Courses) & Test credits (T)
    c. Attempted credit hours include:
        i. Earned hours - Passed (A-D), Pass (P)
        ii. Repeated courses - All attempted (see repeated course section below)
        iii. Withdrawal - "LW" and "W". PACE regulations do not allow for the exclusion of courses in which a student has remained past the drop period and earned a grade of "W".
        iv. Failure - F
        v. Incomplete - I
        vi. All accepted transfer - T

d. The chart below indicates the PACE required to maintain Satisfactory Academic Progress for Financial Aid. New transfer students are placed on the chart based on the number of transfer credits that have been accepted by Clarkson.

Cumulative Attempted Credit Hours	PACE – Minimum required percentage of earned credit hours divided by attempted credit hours
0-18	**50%**
19-36	**50%**
37-54	**67%**
55-72	**67%**
73-180	**67%**

3. Qualitative Standards – Cumulative Grade Point Average (GPA)
    a. Federal regulations require the student to meet minimum Cumulative GPA standards to retain eligibility for aid. As indicated in the following chart, after 4 semesters a student must maintain a 2.00 cumulative GPA to be eligible for financial aid.
    b. Grades earned in prior attempts of repeated courses are excluded from the GPA calculation. The chart below indicates the GPA required to maintain Satisfactory Academic Progress for Financial Aid.
    c. Transfer students are placed on the GPA chart based on the number of semesters they have attended Clarkson

End of semester	Minimum GPA required at the end of semester
First	**1.00**
Second	**1.40**
Third	**1.75**
Fourth-Twelfth	**2.00**

Warning Term

A student who does not meet both the PACE and GPA standards is not making Satisfactory Academic Progress for Financial Aid. The student is notified by the Financial Aid Office that he/she is on Financial Aid Warning for the subsequent term of attendance. During the Financial Aid Warning Term, the student retains eligibility for both federal and institutional aid.

A student who meets both the PACE and GPA standards at the conclusion of the Financial Aid Warning Term is again meeting Satisfactory Academic Progress for Financial Aid and is eligible for federal and institutional aid for the subsequent term of attendance.

A student who does not meet both the PACE and GPA standards at the conclusion of the Financial Aid Warning Term is notified by the Financial Aid Office that he/she is not making Satisfactory Academic Progress for Financial Aid and is ineligible for federal and institutional aid. The student is also notified of the Appeal Process. A student may have more than one Financial Aid Warning Term; however they may not be consecutive.

Appeal Process

A student may file an appeal based on catastrophic or extraordinary circumstances "beyond the student's control," such as personal illness or injury, or the death, illness or injury of a family member, relative or close personal friend. A student is allowed to appeal once based on a change of major.

Students who have been disqualified from aid are notified at the end of the term or when readmitted regarding how to begin the appeal process. It is recommended that students submit the appeal within 3 weeks of notification of their disqualified status.

There are 3 required elements of an appeal:

1. A written statement from the student – Federal regulations require a student who is requesting an appeal to submit a written statement explaining: Why the student was not able to meet the satisfactory academic progress standards. What has changed that will allow the student to meet the standards at the conclusion of the academic plan (See #3 below)
2. Supporting documentation – A student requesting an appeal must submit supporting documentation such as physician's written statement to substantiate illness from clergy, family member(s), or other third party familiar with the student's situation, or a written statement from an academic advisor, professor, or counselor
3. Development of an Academic Plan – As part of the appeal, the student must work with a Program Administrator to develop an academic plan. The academic plan is designed to enable the student to meet both PACE and GPA standards at

the conclusion of the plan. An academic plan may entail one or more terms and includes specific requirements the student must achieve. Although the student is not making satisfactory academic progress, federal and institutional aid is reinstated on a term by term basis.

A student filing an appeal must authorize the release of pertinent information as part of an investigation of the facts concerning the failure to meet satisfactory academic progress standards.

Each appeal will be investigated and reviewed by the Dean of Students in conjunction with faculty members from the student's program of study as well as other Clarkson University personnel as necessary.

The Dean of Students will make a recommendation to approve or deny the appeal and notify the Office of Financial Aid. The Director of Financial Aid will make the final decision to approve or deny the appeal.

The Office of Financial Aid will notify the student by letter or e-mail of the final decision. Upon approval of an appeal including an academic plan the student is placed on Financial Aid Probation for the next term of attendance.
At the end of the Financial Aid Probationary term, the student will be evaluated according to the requirements specified in the academic plan. Provided that the student is successfully meeting the conditions of the plan, the student may continue to receive federal and institutional aid for the subsequent term. In cases in which an academic plan includes more than one term, the student will be evaluated at the end of each term. If the student continue to meet the requirements of the plan, the student remains eligible for financial aid.

A student who does not meet the conditions of the academic plan or whose appeal is denied is no longer eligible for federal and institutional aid at Clarkson until bother standards are met. A student who is ineligible for aid may regain eligibility by:

1. Taking courses at Clarkson without receiving federal or institutional aid that raises their GPA to the minimum standards and/ or increases earned hours to the minimum PACE requirements. The students must contact their SAS representative at the end of the term to request an evaluation of their financial aid satisfactory academic progress standing and financial aid eligibility.
2. Transferring in course credit – A transferred course must count toward degree requirements. A minimum of a "C" is required for transfer credits. Transfer credits are included in both attempted and earned hours. Transfer credits for repeated courses may have an effect on the GPA. Transfer credits for non-repeated courses have no effect on the GPA.

SUBSEQUENT APPEALS - effective March 13, 2020

A student who does not meet the requirements of their academic plan, is permitted to submit a subsequent appeal. The appeal must be based on new extenuating circumstances that have occurred during the current semester and are outside of the student's control.

Repeated Courses

Courses in which a grade of F or W is recorded on a student's transcript may be repeated a maximum of 2 times. The earned hours are counted once. The attempted hours are counted each time and may be used to establish full time enrollment status.

The student may receive financial aid for these course repeats. Courses in which a student has previously earned credit (A, B, C, or D) Federal regulations allow a student to repeat a course once if the student previously earned credit for the course. The repeated course(s) will be used toward full time enrollment status and are eligible for financial aid. Courses repeated more than once will not count toward enrollment status and are ineligible for financial aid. More than one course may be repeated per term. This does not apply to students receiving International Scholarships.

The attempted hours are counted each time. The earned hours are counted once. The grade from the prior completion(s) is excluded from the GPA calculation.

Academic Grade Changes and Incompletes

For purposed of determining SAP for federal and institutional financial aid, all grade changers including incompletes must be submitted to SAS prior to the 10th day of the subsequent term. This deadline may differ from academic departmental guidelines. The student must contact their SAS Specialist to request a recalculation of SAP.

Readmitted Students

A student who has left the University for one or more terms and has been readmitted will have Satisfactory Academic Progress for Financial Aid reviewed at the time of readmission. Transfer credits must be received prior to the 10th day of the term in order to be included in the SAP determination.

If the student is determined to be meeting SAP, federal and institutional aid will be offered provided the student meets all other eligibility requirements.

If it is determined that the student is not meeting SAP, the student will be notified by letter of his/ her status and the appeal process. There is no guarantee that a readmitted student will receive the same type or amount of institutional aid they received during prior terms.

Total Withdrawal from the University & Federal Title IV and Institutional Aid

There are occasions when a student may leave the University prior to the completion of a semester. If a student officially withdraws from the University, takes a leave of absence, unofficially withdraws or is dismissed during the semester, for the purposes of financial aid each of these situations is treated as a withdrawal.

A student intending to leave the University must contact Student Achievement Services to begin the official withdrawal process.

The law specifies how Clarkson must determine the amount of Title IV program assistance a student has earned as of the date of the withdrawal. The Title IV programs that are covered by this law are: Federal Pell Grants, Iraq and Afghanistan Service Grants, Federal Direct Student Loans, PLUS Loans, Federal Supplemental Educational Opportunity Grants (FSEOG) and Federal Perkins Loans.

When a student withdraws from the university during the term, the amount of Title IV program assistance that the student has earned up to that point in time is determined by a specific formula. If the student received less assistance than the amount that earned, the student may be able to receive those additional funds. If the student received more assistance than earned, the excess funds must be returned to the US Department of Education.

The amount of assistance that the student has earned is determined on a pro rata basis. The formula is based upon the number of days the student has attended as a percentage of the total number of days in the term. For example, if the student completed 30% of the term, the student earns 30% of the assistance originally awarded. Once the student has completed more than 60% of the term, the student has earned all of the assistance awarded for the term. Federal regulations require this calculation if the student officially or unofficially withdraws, is dismissed or otherwise leaves the University during a term.

Student transcripts are reviewed at the conclusion of each term. If a student received all “F” grades during a term, federal regulations require the Office of Financial Aid to obtain additional information from the Academic Department(s). If the Academic Department(s) determines that the student completed yet failed to meet the course objectives in at least one course, no changes to the student’s financial aid for that term is required. If however, the Academic Department(s) determines that the student did not complete all courses (i.e. stopped attending all courses); the student is considered to have unofficially withdrawn from the University. In this case, the last date of an academic related activity (i.e. documented attendance in class, submission of a homework assignment or the taking of an exam) is used to determine the date of the unofficial withdrawal. If the last date of an academic related activity is after the 60% date of the term, no adjustment to a student’s financial aid for that term is required. If

however, the date occurs prior to the 60% date, a Title IV refund calculation is required and necessary adjustments to a student's financial aid for the term will be made. In absence of a documented last date of an academic related activity, federal regulations require Clarkson to use the midpoint (50%) of the term.

The Federal Title IV Refund Procedure is separate and distinct from the University's Refund Policy for tuition, fees and other charges at Clarkson. Therefore, a student may still owe funds to cover unpaid institutional charges.

Clarkson scholarships, grants and loans may be reduced based on individual circumstances, the date of withdrawal and the University's Refund Policy. Satisfactory Academic Progress for students who return to the University for a subsequent term will be reviewed and a determination will be made based on the Maximum Time Frame, PACE and GPA standards as stated above.

Student Accounts

Expenses

Tuition and other charges at Clarkson are set at the minimum permissible for financially responsible operation of the University, and are considerably below actual costs. Gifts and grants received through the generosity of alumni, industry, foundations, and friends play an important part with regards to the difference.

The COVID-19/coronavirus pandemic continues to create risks and uncertainties associated with on-campus educational programs of colleges and universities. The potential continuing impacts of the pandemic are not fully foreseeable, and may impact the feasibility and/or structure of on-campus learning. The tuition rates charged by the University are not dependent on the format of the educational programs for which they are payable. Accordingly, if the University is required to alter the structure of its on-campus educational programs or transition students to remote learning models (in whole or in part) due to restrictions imposed by federal, state or local governmental authorities or applicable law, or if the University determines such action to be warranted in light of continuing or potential impacts of the COVID-19/coronavirus pandemic, no reduction or refund of tuition or fees will be made based on the resulting changes to the programs in which students are enrolled.

University Charges

The summary of annual fixed University charges for the 2022-2023 academic year follows:

Fixed Charges 2022-2023	
$54,960	Undergraduate full-time charge (12 to 19 credit hours)
$1,832	Undergraduate credit hour rate (11 hours or less)
$10,387	Room (based on highest room rate)
$7,766	Meal Plans
$1,298	Undergraduate student fees
$1,848	Clarkson School student fees
$74,411	Undergraduate full time direct costs

Undergraduate students registered for 12 to 19 credit hours (inclusive) are designated as full-time students and are charged at the full-time rate. Students exceeding the full-time load of 19 credits will be charged at the credit hour rate for each credit hour in excess of 19 in addition to the full-time tuition rate charge.

Other expenses, such as travel, books, and spending money, vary. An estimated figure is approximately $3,916 for one academic year.

Clarkson University Student Association (CUSA) Activity Fee

Assessed by CUSA on all undergraduate students carrying a minimum of 6 credit hours per semester and distributed to clubs and organizations.

Clarkson University Student Association (CUSA) Campus Improvements Fund Fee

Assessed by CUSA on all undergraduate students carrying a minimum of 6 credit hours per semester for capital projects as identified by students.

Resources Fee

Assessed to all full-time students. Covers operations for recreational facilities, fitness facilities, health facilities & services, counseling facilities & services, computing facilities, services & related software, webinars, etc.

The Clarkson School Event Fee

Assessed to The Clarkson School students to assist in covering various student activities such as field trips. In addition, a portion of the fee provides for any guest lectures and special meals sponsored by The Clarkson School.

Health Insurance

Health insurance is mandatory at Clarkson University for non-distance program students. All students must either have health insurance coverage under their own policy or be covered by their parent's policy or enroll in Clarkson's contracted insurance. The rate for 2022-2023 is $2,572 for coverage from 8/1/2022 – 7/31/2023. To assure clearance for check-in, students need to complete an activity guide in their myCU account and secure an approved waiver if need be on a yearly basis.

Payment

Payment in full for all tuition, fees, residence and dining expenses must be made on or before the financial clearance deadline. Check-in cannot be completed and the student cannot be admitted to class unless satisfactory payment is made. All accounts will be assessed a late fee charge of 1% of the unpaid balance monthly. Enrollment indicates that the student agrees to pay all attorney's fees and other reasonable collection costs necessary for the collection of any amount not paid when due and will be added to the unpaid balance. It is the University's policy to withhold diplomas until the balance of the account is paid in full.

Tuition and Fees Refund Policy

All refunds will be based on the last recorded day of attendance as determined by and attested to by the Student Achievement Services Office. A student who withdraws within the first 20 class days of the term is eligible to receive a refund using the following refund calculation:

Semester (Fall & Spring) Program Refund Policy	
Prior to the start of the term	100% refund
1st week of the term	90% refund
2nd week of the term	75% refund
3rd week of the term	50% refund
4th week of the term	25% refund
5th week of the term until the end of the term	0% refund

The corresponding refunds calculations above will be applied to tuition, CUSA Activity Fee, CUSA Campus Improvements Fund Fee, Resource Fee, The Clarkson School Event Fee, Room and Meals (consumption is not taken into consideration).

There will be no refund of the Student Health Insurance Premium if the coverage is in force.

This refund policy has been established in conformance with the Higher Education Act of 1992, as amended in April & November of 1994 and by GEN-95-22 (Dear Colleague Letter) of April of 1995.

An exception to the Refund Policy has been made for students that are enlisted and active (prior to the start of the term) in the military that are forced to withdraw during a term due to a military deployment or a change of assignment. Official documentation of the deployment or change or assignment may be requested by Clarkson University from the student for the exception to the Refund Policy to take effect. The following adjustments to the student's account can be expected if the student meets the aforementioned criteria:

- 100% refund of tuition, fees and room
- This exception to the Refund Policy does not apply to Board or Student Health Insurance

Academic Support & Student Engagement

Cathy McNamara, Associate Vice Provost of Academic Support & Student Engagement

The Student Success Center houses units that are supporting campus-wide efforts to strengthen and enhance objectives related to Student Achievement Services with particular emphasis on first-year engagement, tutoring, academic skills development, and opportunity program administration.

The following outlines the services offered by Student Success Educators.

Academic Support and Preparation	Student Enrichment & Engagement	Access and Opportunity
Tutoring Academic Skills Development Holistic Advising Support International Student Language support Student Success Workshop Series Pre-Freshman Summer Bridge Program Springboard early arrival programs First Year Seminar Academic Recovery Seminar Professional Development Seminar	Read Across America Trio Day Legislative Advocacy & Education NYS Opportunity Programs Leadership Conference CSTEP Statewide Conference and Research Symposium Camp Oswegatchie Summer Scholar Teambuilding Alumni speaker series Student Advisory Board	Grant Funded Programs: ** CUPO McNair Scholars CSTEP NSF LSAMP HEOP SSS

Retention	Graduate School Awareness and Planning
University Retention Data Assessment & Support SafetyNet CU Connect Summer Housing insecurity program Financial Literacy	Summer Undergraduate Research Program Graduate school prep series MCAT Prep Tutor training series with CRC

**The Community of Underrepresented Professional Opportunities (CUPO), Collegiate Science and Technology Entry Program (CSTEP), Ronald E. McNair Post Baccalaureate Achievement Program (McNair), Louis Stokes Alliance for Minority Participation Program (LSAMP), Higher Education Opportunity Program (HEOP), Student Support Services (SSS)

Enrollment is the crucial first step toward achieving a diverse community. Funding streams that support access to Clarkson — scholarships, specialized admissions programs and K-12 outreach programs and summer camps — are crucial to meeting our goals of expanding the world reach and diversity of the Clarkson community and to supporting our commitment to creating a university for the 21st century.

A transformative campus experience, which incorporates and supports aspects of academic success, campus involvement, and leadership and professional development opportunities, will positively affect retention and is the vital link to future career and personal success as well as lifelong engagement with Clarkson.

First Year Seminar, FY 100
This freshman seminar introduces students to Clarkson University's mission where we "strive to attune ourselves and our programs to our global, pluralistic society". Through project-based learning, students engage in research and dialogue with the intention of developing a set of behaviors and attitudes that create a sense of belonging for each participant and enable them to work effectively in diverse situations. Classroom discussions, facilitated by guest speakers and Peer Educators, are designed to promote self-reflection, constructive dialog, and improved communication skills. The aim of First Year Seminar is to aid in the development of citizens attentive to our campus, local, national, and world community needs.

Academic Recovery - UNIV 100
University Skills Seminar is a seminar-style course that is designed as a positive intervention for first and second year students who demonstrated low academic performance and/or were academically separated in the previous fall semester at Clarkson University. The course is meant to facilitate a holistic approach to academic success and foster retention in participating students. Students will use this course to identify their unique barriers that may impede their academic experience and develop an action plan to overcome these barriers. Students will take a deep dive into the resources available at Clarkson and create individualized action plans that outline which specific resources are needed for the student to achieve academic success. This course will place a focus on building the academic skills necessary to be a successful student at Clarkson, focusing on STEM learning, critical analysis and writing skills. The students will develop and apply time management, academic and study skills that are essential to success in higher education. This course is meant to foster autonomous, self-advocating learning and professionals. The course will focus on forming sustainable and healthy habits that will help students not only reach their academic and personal goals, but foster a stronger sense of emotional and mental wellness. Students will learn about creating a work-life balance as their academic career becomes more rigorous with the goal of becoming better prepared for their professional job search, make confident academic major choices, and develop a greater understanding of post-graduate career options.

MCAT
Test Prep is designed to help pre-med students prepare for the exam. This course is a non-credit course and is offered as a yearlong course beginning in the fall semester.

CU Connect Mentoring
A university wide mentoring program in which every student is connected with a staff or faculty member in the first week of school to help with the transition to college. Underrepresented students' mentors are hand selected from over 80 volunteers to mentor students who are strategically placed within our campus community.

Student Support Services
Trio grant funded by the Department of Education to serve 160 students who hail from low-income/first generation or students with disabilities. The persistence rate meets and often exceeds 94% and graduation rate meets/exceeds 83%.
Tutoring Services
The Clarkson University Tutoring Program, for which there is no fee, is for on-going, long-term assistance, and is offered in small group, as well as "drop-in" formats. The tutoring staff consists of qualified undergraduates within the University who are overseen by staff members.

Clarkson has two drop-in tutoring centers which are open up to five days a week in the evenings, helping primarily with courses from math, physics, chemistry and engineering.

We also offer small group tutoring throughout the semester. These groups meet weekly for 1.25 hours, scheduled around individual schedules and students join them by registering online.
These services are very popular with our students, with many seeking out one or both methods of tutoring assistance.

New York State Arthur O. Eve Higher Education Opportunity Program (HEOP)
The Clarkson University New York State Arthur O. Eve Higher Education Opportunity Program (HEOP) is funded jointly by the University and a HEOP grant through the New York State Education Department. Clarkson HEOP offers college access and a comprehensive academic support system to assist in student academic success. The program provides a broad range of services to students who, because of academic and economic circumstances, would otherwise be unable to attend a postsecondary educational institution. Clarkson HEOP students have access to a significant student-centered support system, including the Summer Pre-Freshman Experience (SPREE) and academic-year guidance and support.

The Community of Underrepresented Professional Opportunities (CUPO)
The CUPO office is the shared home to the Collegiate Science and Technology Entry Program (CSTEP), the Ronald E. McNair Post-Baccalaureate Achievement Program (McNair), the Louis Stokes Alliances for Minority Participation Program (LSAMP), and the Academic Success Program to Improve Retention and Education (ASPIRE). The creation of this office brings together four long-standing federal and state Department of Education and National Science Foundation programs in one location, providing ease in access to services for students. The CUPO office provides academic enrichment and support, graduate school preparation, career and professional development, research opportunities, and social and cultural experiences for eligible students.

CUPO Collegiate Science and Technology Entry Program (CSTEP)
Funded to serve 90, the purpose of CSTEP is to increase the number of historically underrepresented and economically disadvantaged students pursuing careers in STEM fields or NYS licensed professions. CSTEP is sponsored by the New York State Education Department. Clarkson's Collegiate Science and Technology Entry Program (CSTEP) has been in existence since 1994 and has served over 400 students.
The CSTEP program helps to assure a competitive advantage to eligible students by providing academic support, enrichment activities, career development, and graduate school preparedness. Students are provided with academic guidance and tutoring. Along with this, the office provides academic success workshops and a lending library of textbooks laptops and other important tools for success.

The CSTEP staff helps students meet the challenges of the competitive STEM field by offering career guidance and skill building that will help students identify and prepare for a career. Students are given opportunities to participate in activities such as conferences; networking with corporations, other colleges and universities; as well as meeting with Clarkson University alumni. This builds their career network, and may lead to becoming involved with research, co-op, study abroad, or internship opportunities. CSTEP offers assistance with various graduate and professional exams, and with applying to graduate schools when approaching the end of baccalaureate degree requirements.

CUPO Ronald E. McNair Post Baccalaureate Achievement Program (McNair)
The McNair program, a federal TRIO grant funded by the US Department of Education, serves 30 students per year. Participating in the program allows students firsthand experience in cutting-edge research with faculty member mentors who are dedicated to their teaching and research.

Clarkson's research for McNair Scholars focuses on STEM disciplines. Students in McNair complete a 10-week intense research program, filled with graduate school workshops, GRE preparation, and seminars by alumni and faculty with PhD's. Students present their research at a national McNair Conference and at Clarkson's summer SURE Symposium. The goal of the McNair program is to have historically underrepresented and economically disadvantaged, first-generation college students enter graduate school and attain a PhD.

CUPO Louis Stokes Alliance for Minority Participation Program (LSAMP)
LSAMP is a program aimed at increasing the quality and quantity of African, Latino, Asian, and Native American (AALANA) students successfully completing science, technology, engineering and mathematics (STEM) baccalaureate degree programs, and increasing the number of AALANA students matriculating into graduate programs. The program goals are accomplished through the formation of alliances. The Consortium is comprised of seven institutions: Syracuse University (the lead institution) and Clarkson University, Cornell University, Rensselaer Polytechnic Institute, Rochester Institute of Technology, and Monroe and Onondaga Community College.

The Shipley Center for Innovation

Jamey Hoose, Director, jhoose@clarkson.edu

The Shipley Center for Innovation, which is organized within the Office of Sponsored Research Services, is a University-wide resource dedicated to bringing Clarkson innovations to market via technology transfer, gaining recognition for the technology created by our faculty and students, and creating local jobs for graduating Clarkson students. The Center, which acts as the "business incubation" component of Clarkson Ignite, serves as an engine for economic development in the North Country by engaging in the creation of new enterprises that capitalize on emerging technologies.

In addition to providing general mentorship and services to Clarkson startups, the Shipley Center manages a thriving business incubator location on Clarkson's downtown campus. In 2018 the Shipley Center launched a new student accelerator program, The Cube, which provides dedicated student entrepreneurs with additional resources to help grow their idea into a profitable company. Shipley Center staff also conduct workshops and hold office hours to provide instruction in basic early-stage concepts such as business modeling and customer discovery.

The Associated Colleges Consortium

The Associated Colleges of the St. Lawrence Valley was chartered in 1970 to stimulate a variety of cooperative activities among Clarkson University, St Lawrence University, SUNY Canton, and SUNY Potsdam. With only 10 miles separating the four campuses, a significant amount of social, cultural and academic cooperation is possible.

Clarkson students have ready access to most resources at the other colleges. Special events are publicized through joint calendars and other means. Each of the four libraries permits students from all of the colleges to draw upon the total holdings of approximately one million volumes (See Educational Resources Center).

Students may cross-register for courses within the consortium, and some sharing of faculty takes place. To be eligible to cross-register, undergraduate students must be enrolled in at least 12 credits at Clarkson, including the cross-registered course, eligible students can take up to two courses (not available in their home institution) per academic year totaling no more than eight credits on a space-available basis at one or another of the campuses. An academic year for cross-registration includes the fall and spring semesters.

A form for cross-registration is available at
https://associatedcolleges.org/services/cross-registration/

Students will be enrolled as non-matriculated students at the host institution and the course(s) will be transcribed at the host institution. At the end of the semester, an official transcript will be sent to the student's home institution and credit will be posted as transfer credit on their Clarkson transcript. Undergraduate students must receive a grade equivalent to a C (2.000) or higher at Clarkson. Grades in such courses are not used in computing a student's GPA, and are not counted toward the minimum number of credits required for academic honors. If cross-registration credits results in a course load requiring additional tuition charges, the student is responsible for those additional charges.

University Libraries

Michelle L. Young, Dean of Libraries/ Associate Professor
myoung@clarkson.edu office 315-268-4268, mobile 315-323-7910

The University Libraries provide comprehensive knowledge resources and services to support research, scholarship, teaching, and learning. We are dedicated to offering collaborative support for exploration, discovery, and life-long learning skills to all Clarkson University faculty, staff, students, and to citizens of our local community no matter their location and with respect to diverse needs.

The Harriet Call Burnap Memorial Library is the main library located on the Potsdam Collins Hill Campus in the Educational Resources Center (ERC). Its collections offer materials in various formats including journals, books, audio visual materials, government documents and reports, Clarkson University dissertations, and archival materials. The Health Science Library (HSL) is the University Libraries' branch library and is located in the The Earl R. and Barbara D. Lewis School of Health Sciences (Clarkson Hall) on the downtown Potsdam campus. It provides a wide range of information resources focused on medicine and healthcare. Both locations offer a comfortable place for study as well space for collaborative work and learning.

Physical Education

Scott Smalling, Director of Athletics & Recreation
Bill Bergan, Director of Physical Education

Physical Education offers an array of optional courses that vary based upon student interest and the season. The program is designed to offer a variety of activities in individual, lifetime and team sports which augment the required Personal Wellness course. Special attention is given to those activities with significant carry-over values for lifelong participation.

Optional Physical Education Courses
Optional physical education courses include Weight Training Techniques, EMT/CPR Lifesaving, Gold, Racquetball, Aerobic Fitness, and Badminton. In cooperation with the University medical staff, the Physical Education Department will assist those students who are physically disabled to design a program best suited to their capabilities.

The Henry R. Hodge Sports and Recreation Complex is located on the Potsdam campus, adjacent to the residence halls and easily accessible to all students. Facilities include the Denaka Family Fitness Center, Alumni Gymnasium, Schuler Recreation Building (which houses the Stephenson Field House and the Fuller Pool), the Denny Brown Adirondack Lodge, and the Snell Athletic Fields. Additional facilities include Walker Center, Hantz Turf Field, Bagdad Field, Scott Field, Neugold Field, and the Cheel Campus Center and Arena.

The Department of Athletics and Recreation offers a number of summer camp opportunities. For more details, contact 315-268-6622 or visit the website.

UNDERGRADUATE ADMISSION

Matthew Rutherford, Director of Admissions mrutherf@clarkson.edu

Candidate for admission to Clarkson as first year students are graduates, or soon-to-be graduates of a secondary school, preparatory school or equivalent educational process. In special instances, students are considered for early admission provided their academic records demonstrate a very high potential for academic success. In these select cases, students may be required to take an Ability to Benefit Test as prescribed by both state and federal education departments. In addition to superior scholastic achievement, consideration is given to personal qualities, participation in meaningful extracurricular or out-of-school activities, leadership and other information that may indicate the potential for successful completion of a college career.
The Committee on Admission places particular emphasis upon the following:

1. The secondary school record
2. Clarkson University has adopted a test optional policy for the 2022-2023. Students may submit self-reported scores if they choose for purpose of application review. Official scores will be required prior to enrollment if the student has chosen to submit scores as part of their application. See policy guidelines.
3. The personal statement describing a special interest, experience or achievement that is important and meaningful to you.
4. The recommendation of the principal, headmaster, or school counselor
5. Students for whom English is not their first language are required to submit TOEFL, IELTS or Duolingo Test of English Language scores.
6. SAT subject tests are optional

A personal interview and a visit to the campus are strongly recommended. The purposes of the interview are to increase the applicant's knowledge about Clarkson, provide an opportunity for the applicant to ask questions, and to share information about relevant personal, extracurricular and coursework preparations and backgrounds. For more information, call 800-527-6577 or email admissions@clarkson.edu. Candidates for admission to Clarkson as transfer students should review the transfer admission section below.

Academic Preparation

A thorough secondary school background in English, mathematics, and sciences is important in the academic preparation of a candidate for admission. Among the 16 units of secondary school work, the applicant's record should include the following:

Engineering, Science, and Engineering & Management Programs	**Business and Liberal Arts**
● English (4 units) ● Mathematics (4 units) ● Science, including (3-4 units): Chemistry (1 unit) Physics (1 unit)	● English (4 units) ● Mathematics (3 units) ● Sciences (1 unit)

High school mathematics preparation should emphasize the thorough mastery of fundamental definition, concepts, principles and operations. The applicant must have sufficient preparation in algebra and trigonometry to begin the study of calculus. Courses in the sciences should stress basic principles and conceptual and quantitative understanding through classroom and laboratory work. Chemistry and Physics are particularly important as background for Clarkson's first year science courses.

First Year Application Procedure

Students can apply using either the Clarkson University Application or the Common Application. The applications are available at Applying for Undergraduate Programs.

The application fee is waived for students who submit an application online. Candidates are encouraged to submit their completed applications between October 1 and January 15 of their final year in secondary school. It is the student's responsibility to make certain that appropriate secondary school transcripts, SAT or ACT test results if students choose to submit for consideration, and recommendations are provided either with the application or promptly thereafter.

Applications submitted after January 15 are given full consideration in the order of their completion.

Offers of admission continue only if space permits.

Students wishing to postpone admission for a year may do so. The procedure is to apply for admission in the senior year of secondary school and, when making the deposit reserving a place in the class, request a one-year extension. Most requests for deferred admission mention an intention to work or to travel before beginning college.

Early Decision Plan

Early Decision is an option for students who after careful consideration are certain that Clarkson is their number one college choice. The plan does not prohibit the student from making other applications, but it does commit the student to withdraw other applications if accepted at Clarkson. Early Decision candidates are strongly encouraged to visit the campus and meet with our students, faculty, and staff. The Early Decision deadline is December 1 of the senior year. The high school record through grade eleven, SAT or ACT test results if students choose to submit for consideration, and recommendations should be received no later than December 15. Admission notification will occur by January 1. Students who complete the Free Application for Federal Student Aid (FAFSA) will also receive financial aid notification.

Personal Interview

An informal interview is very helpful to the student in formulating college plans and is strongly recommended. It provides an opportunity to ask questions and gain a direct impression of the opportunities Clarkson offers and to determine the student's "fit" with the University. This interview should be held on the campus with an admission staff member if possible, since a personal visit to Potsdam is highly recommended, for students receiving selected scholarships the interview is required.

The Office of Admission is open on weekdays from 9 a.m. until 4 p.m. and on Saturdays by appointment only. Interviews on campus should be arranged by email or phone at least one week prior to the intended visit. A personal interview conducted by a local alumnus/in the student's hometown area may also be arranged through the Admission Office. The telephone number, for use during normal business hours, is 800-527-6577 or 315-268-6480 or via email at admissions@clarkson.edu.

Notification

All applicants are promptly notified upon careful review of completed credentials. In the event that it is necessary to postpone action pending the receipt of final grades, or for other reasons, applicants will be notified. Notification of admission begins in January of the senior year if all materials have been received.

Deposit

A $500 deposit is required when the first year candidate accepts the offer of admission; the class is filled as deposits are received. The deposit is payable any time prior to the Candidate's Reply Date, as established by the National Association for College Admission Counseling. The reply date is May 1st. The deposit is credited to the first year University charges. It is nonrefundable if the student decides not to attend Clarkson.

Transfer Admission

Clarkson prides itself on the success and strength of its Transfer Program and has put in place numerous transfer articulation agreements with two year (2+2 programs) and liberal arts institutions (3+2 engineering programs) within the United States. For a current list of institutions with which Clarkson has articulation agreements, please visit Articulation Agreements. Unlike most institutions, Clarkson has established a separate office within Undergraduate Admission dedicated to the needs of transfer students. As a result of this commitment to transfer students, Clarkson and, the local community, welcome a large number of new transfer students each fall and spring to the campus. The quality and success of these students is consistently reflected in the praise from the faculty and those who graduate with honors.

Application Process

Transfer applicants are defined as those students who have graduated from secondary school and, after the first full time experience as a matriculated student at another university or post-secondary institution, wish to continue their college education at Clarkson. Transfer applicants are admitted on a rolling basis (as their files become complete); however, the preferred deadline for completed applications is July 1 for fall admission and December 1 for spring admission. Applicants must complete the following steps:

1. Submit a completed Transfer Common Application or Clarkson University Transfer Application at https://www.clarkson.edu/apply-now
2. Arrange for official transcripts to be forwarded from each institution previously attended and/or currently attending. Course descriptions in English are required for international students, if necessary.
3. Submit the Dean of Students Recommendation or Common Application College Report. This can be completed by Dean or equivalent title.
4. Clarkson University has adopted a test optional policy for the 2021-22 admission cycle due to impact of COVID-19 on availability and accessibility of standardized testing. Students may submit self-reported scores if they choose for purpose of application review. Official scores will be required prior to enrollment if the student has chosen to submit scores as part of their application. See policy guidelines.
5. Arrange for TOEFL scores to be submitted if English is not their first language. A 550 (paper based), a 213 (computer based), or 80 (internet based) score is required for admittance. Acceptance of other English testing exams such as Duolingo Test of English Language or IETLS are approved.
6. Submit two letters of recommendation, including one from an academic professor/ instructor (optional).
7. A personal statement describing a special interest, experience or achievement that is important and meaningful to you

In addition, applicants should be aware that:

1. The $50 application fee is waived by applying online or by completing an on- or off- campus or virtual interview
2. An on- or off- campus or virtual interview is optional, but strongly recommended

Once a student's file is complete, it will be reviewed for admission. Students who accept the offer of admission must submit a $500 deposit which will be credited to the first year University charges. It is non-refundable if the student decides not to attend Clarkson.

After acceptance to Clarkson, the appropriate academic department evaluates transcripts to determine the number of credits to be transferred. If needed, the faculty member may recommend courses to be taken in the final term or summer before transfer. The evaluator will also propose a tentative course schedule for the student's first semester on campus. This evaluation is completed and mailed to the student with approximately two weeks of acceptance.

Financial Assistance for Transfers

Clarkson has financial assistance opportunities available for entering transfer students. Please check the Scholarships and Financial Assistance section of this catalog.

2+2 Transfer Student Policy

The 2+2 Transfer Program is based on articulation agreements with two-year colleges. These agreements typically specify a program of study at the two-year institution that will prepare students to enter Clarkson with junior status (54+ credits). These agreements cover students wishing to study engineering, business, science, or other disciplines.

Students who do not attend an institution with a formal 2+2 agreement are also encouraged to apply. The lack of an agreement does not mean that a student is ineligible for transfer or will not receive transfer credit for courses. Transfer coordinators interested in establishing a formal agreement should contact the Director, Office of Transfer Admission, Clarkson University, and Box 5610, Potsdam, NY 13699.

3+2 Engineering Transfer Program

The 3+2 transfer programs are established with many colleges and universities in the United States. Students who participate take the first three years of the prescribed program at a four- year liberal arts institution. Subsequently, they transfer with junior standing into one of Clarkson's four-year engineering curricula. Upon satisfactory completion of two years of engineering courses, students receive degrees from both institutions. The 3+2 program provides students with an opportunity to obtain an exceptionally broad and firm academic foundation in the arts and sciences coupled with

specialized training in an engineering discipline. For further information, please visit http://www.clarkson.edu.

International Student Admission

As an internationally recognized institution, Clarkson has both undergraduate and graduate students and faculty from more than 44 countries. This multicultural richness is evidenced on campus in our student organizations, successful multicultural events and the number of events/trips scheduled by the International Student Organization (ISO). International students can enter Clarkson as first-year students, transfer students, graduate students, or as part of a University exchange program. For the purpose of admission, an international student is defined as a student who is studying or wants to study in the U.S. on a nonimmigrant visa. This definition does not include permanent residents or refugees who should apply using the same procedures as domestic students.

International students are a critical component of the Clarkson Community and integral to the mission and vision of the University (see The Clarkson Education). Clarkson wants all students to graduate with a firm academic understanding of their chosen field, with excellent written and oral communication and presentation skills, and knowing how to work effectively in diverse multicultural teams. To assist international students in attending Clarkson, the institution:

1. Provides merit-based international scholarships to qualified applications;
2. Has an International Student Advisor on campus;
3. Supports several international student organizations; and
4. Has established a special office in Undergraduate Admission to support international students

International Student Admission Requirements

To complete your file and process your application, we require the following documents:

Official Transcripts. Transcripts should include an English translation, if necessary. Mid-year and final grades also should be sent as they become available. National exam scores should also be submitted, if available.

TOEFL (Test of English as a Foreign Language), the PTE – Pearson Test of English, Duolingo Test of English Language or IELTS (International English Language Testing System) scores submitted (if English is not your primary language). For further information on these exams, please visit www.ets.org/toefl, https://pearsonpte.com/the-test/, https://englishtest.duolingo.com/edu or www.ielts.org/.

See the information regarding English requirements below.

The *SAT* Reasoning Test is for first-year candidates only. For more information about the SAT and how to register for it, contact the College Board at http://www.collegeboard.org/. (Students from mainland China are exempt from this requirement.)

Certificate of Finance. The Certificate of Finance is required to verify the student's sources of financial support for his/her expenses during the one-to-four years at Clarkson. In addition to completing the form, financial documentation verifying the source of funding is required from a bank, employer, or sponsoring organization. Once a student is accepted by the institution, the Certificate of Finance is processed, and the enrollment deposit is submitted, an I-20 will be issued. The I-20 will reflect any merit-based scholarship awarded to the student. The Certificate of Finance form is provided by the International Admission office.

Recommendations. A minimum of two recommendations should be submitted, preferably one from a math or science teacher for applicants wishing to pursue an engineering or science degree. The letters should discuss the student's ability to succeed at the university level and present reasons to admit the student. *Personal Statement*. Describe a special interest, experience or achievement that is important and meaningful to you.

Campus Visit/Interview (optional). International students are strongly encouraged to visit the campus or schedule an interview via video or phone. The International Admission Office (tel. 315-268-2125) can greatly assist in coordinating the visit to include pick-up from nearby airports, arranging for student hosts, faculty appointments, campus tours, admissions interview, meals, and hotel arrangements.

Application Fee: There is a required $50 application fee for International first-year applicants. The application fee is waived for students who apply online. Once a student's admission application file is complete, it will be reviewed and a decision made.

At the time of admission, an International student is considered for a merit-based international scholarship. The awards vary according to the strength of the student's academic record, and ranged from $10,000 to $40,000 per year in 2020. Students who accept the offer of admission must submit a $500 nonrefundable deposit to reserve a place in the entering class which will be credited to the first year University charges.

Admission Criteria for International Students
Students are selected for admission based on the following:

1. Academic performance in secondary school, college, or university, and class standing
2. Recommendations
3. Clarkson University has adopted a test optional policy for the 2021-22 admission cycle due to impact of COVID-19 on availability and accessibility of standardized testing. Students may submit self-reported scores if they choose for purpose of application review. Official scores will be required prior to enrollment if the student has chosen to submit scores as part of their application. See policy guidelines.
4. TOEFL, PTE – Pearson Test of English, Duolingo or IELTS (English Proficiency) scores
5. Participation in extracurricular events, community service, and sports
6. Essay and interview (if completed)

Financial Aid/ Scholarships for International Students
International Scholarships: All international students are considered for scholarships based on their academic record that includes: grade-point average, class standing, SAT and TOEFL scores and letter(s) of recommendation. No financial assistance application is required. International student awards are available ranging from $5,000 to $40,000 per year.

Honors Scholarship: Students who are accepted into the Clarkson Honors Program receive an additional merit award. The Honors Program is aimed at providing a special environment for top students. To be considered, students need to be in the top 10% of their class and have excellent standardized test scores. For more information, please see the Honors entries in this catalog (see Academic Program Options).

Employment: International students are allowed to work on campus for up to 20 hours per week. The jobs include office worker, lifeguard, food service, etc. The number of positions available varies from year to year.

Loans: There are private lenders who offer educational loans to international students. In most cases, eligible students may borrow up to the cost of attendance less any financial aid for a given year provided they have a U.S. citizen or permanent resident co-borrower. Clarkson does not recommend any particular lender and does not offer a preferred lender list. Students are free to borrow from the lender of their choice.

English Requirements
Admission to Clarkson University requires a minimum TOEFL of 550 (paper based), 213 (computer based), or 80 (internet based), IELTS of 6.5, proficient PTE -Pearson Test of English or Duolingo Test of English Language scores for undergraduates. Students may submit on a case-by-case basis other proof of English proficiency. Request for waiver of exams should be sent to the Coordinator of International Students.

I-20 Visa
U.S. Citizenship and Immigration Services (USCIS) is the branch of the U.S. government that regulates the status of all people visiting the United States who are not citizens, including immigrants, visitors, students, and permanent residents ("green card" holders). International students attending Clarkson will be classified as nonimmigrant, subject to a number of regulations. They should take the time to understand their situation and to fulfill legal obligations. The International Students & Scholars Office will assist with Visa/I-20 issues, and can be reached by telephone at 315-268-7970 or by mail at Clarkson University, Box 5651, Potsdam NY 13699, USA.

To obtain a visa, students should submit an application and supporting documents with their passport to the U.S. Consulate or Embassy that has jurisdiction for their place of residence. Students must also submit the required SEVIS fee to the U.S. Department of Homeland Security prior to applying for their visa. Visit http://www.fmjfee.com/ for more information.

The supporting documents usually consist of the acceptance letter sent to the student by Clarkson; an I-20 for an F-1 (student) visa; evidence of ability to pay for studies; and sometimes evidence that the student does not intend to become an immigrant to the U.S.. Please check the specific requirements for your home country. When the Consul is satisfied with the application, the student's passport will be returned with a visa stamped in it. This stamp allows the student to enter the U.S. only when possessing the I-20.

It is not necessary for Canadian students to obtain a visa at the Consulate. They simply present their I-20, passport and evidence of support at the border. Canadian students are required to pay the SEVIS fee prior to their arrival at the border crossing.

For a list of Consulates and Embassies, including addresses and phone numbers, visit https://www.usembassy.gov/. Further international information can be obtained at https://www.clarkson.edu/international-center.

Accelerated Admission Graduate School Policy

This policy is intended to encourage early consideration and preparation for graduate work at Clarkson by highly qualified students. Such students would likely participate in undergraduate research experiences and would have identified a graduate advisor before baccalaureate graduation. These students may also be interested in accelerating their course of student to graduate within three years in order to begin their graduate work as soon as possible.

Any student who completes at least two years of residential study at the University and who has received a baccalaureate degree from Clarkson will automatically be accepted into any Clarkson graduate program for a master's degree, at minimum, if he or she meets the conditions below at the time of entry to Graduate School. Eligible students must have:

1. Graduated in good standing from Clarkson within the previous year and have taken any necessary prerequisite courses for entrance to the graduate program in question;
2. Exhibited the quality of character expected of an entering graduate student of Clarkson University, as indicated by a letter from their academic advisor, department chair, or the dean of the school in which their baccalaureate degree resides;
3. Maintained a minimum grade-point average of 3.500 in their major; and
4. Achieved a school-defined minimum score on a designated national exam, the CUSB requires the GMAT or GRE exam and all others require the GRE

Applications for graduate admission from students receiving a Clarkson University baccalaureate degree who have not met all conditions specified above will still be considered, but admission will no longer be automatic. Please see the Graduate Catalog for The Graduate School application procedures. Exclusions to the automatic acceptance practice may be in effect per program requirement.

Part-Time Matriculated Students

A person may pursue a baccalaureate degree as a part-time matriculated student. For further information, contact sas@clarkson.edu.

Advanced Placement/ Advanced Credit

A majority of students receiving Advanced Placement credit at Clarkson have taken the Advanced Placement Examination of the College Board. The most common AP areas are listed below. Credit in more other subjects is awarded when a score of 4 or greater is received.

Clarkson also grants credit based on International Baccalaureate Exams and CLEP Exams. Advanced Placement credit based on tests or examinations (includes AP, CLEP, IB, etc.) will be limited to a combined 30 credit hours. For further information, review section III-K of the Undergraduate Regulations (https://www.clarkson.edu/student-administrative-services-sas/clarkson-regulations).

Below is a list of AP scores and the transfer credit it translates to:

Biology		**Chemistry**	
AP Score	**Course Credits**	**AP Score**	**Course Credits**
1,2, or 3	No credit	1,2, or 3	No credit
4	BY 100 Biology Elective with Lab	4	CM 131 General Chemistry
5	BY 140/142 and BY 160/162 Biology I and II with labs	5	CM 131/132 General Chemistry I/II

Computer Science*	
AP Score	**Course Credits**
1,2, or 3	No credit
4 or 5	CS 141 Intro. To Computer Science

English			
AP Score	**Language and Culture Credit**	**AP Score**	**Literature and Culture Credit**
1,2, or 3	No credit	1,2, or 3	No credit
4 or 5	COMM 210 Theory of Rhetoric	4 or 5	LIT 101 Literature and Writing

Mathematics**				
AP Score	**Calculus AB Credit**	**AP Score**	**Calculus BC Credit**	
1,2, or 3	No credit	1,2, or 3	No credit	
4 or 5	MA 131 Calculus I	4	MA 131 Calculus I	
		5	MA 131/ 132 Calculus I/II	
1,2, or 3	No credit	No credit	No credit	No credit
4 or 5	SC 141 Intro to Physics I	SC 142 Intro to Physics II	PH 131 Physics I	PH 132 Physics II

**The Computer Science Department schedules an exam in C++ or Java for new students during the fall orientation each year. Students earning a satisfactory grade receive credit for CS 141 Introduction to Computer Science I. The exam may also be taken in other pre-approved languages. Contact the Computer Science Department for more information.*

***To be eligible for AP credit MA 131 or MA 132, first year students must also perform at a satisfactory level of the Math Readiness Survey (which is taken in late May) or successfully complete the on-campus advanced-standing exam given in the first week of the fall semester. For more information, see the department webpage at https://www.clarkson.edu/academics/arts-sciences/mathematics.*

****Credit awarded for Physics 1 or Physics 2, non-calculus-based physics, will not substitute for PH 131 and/ or PH 132 required by many Clarkson majors.*

Advanced Placement Credit through College Course Transfer

Students may enter Clarkson having already taken college courses while still in high school. Such courses will be considered for academic transfer credit if a grade of C or better was earned. Students should send an official college transcript as well as a course description to Student Administrative Services as soon as available. The course(s) will be evaluated for transfer credit by the academic department responsible for course curriculum.

Credit by Examination

Availability of such exams are at the discretion of the appropriate department chairperson. Students interested in Credit by Examination are encourage to notify the appropriate department as early as possible so a mutually convenient time to take the exam can be arranged. Note: Students who plan to take either or both the Calculus and Computer Science exams scheduled during fall orientation need make no special arrangements. These exams are scheduled into orientation.

Clarkson will consider the following for advanced credit: AP, CLEP, GCE A-levels, IB, OACs, French Baccalaureate, Abitur, Italian Maturita and the Swiss Maturite. While credit is usually granted, there are situations, due to the technical nature of some of the programs, where it is not. Each case will be reviewed on an individual basis. Advanced Placement credit based on tests or examinations (includes AP, CLEP, IS, etc.) will be limited to a combined 30 credit hours.

SCHOOL OF ARTS AND SCIENCES

Darryl Scriven, Dean
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Jerry W. Gravander, Associate Dean
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Jason Schmitt, Associate Dean of Strategic Development & Recruitment
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The School of Arts & Sciences offers an array of major programs. Some are in traditional disciplinary areas such as Biology, Chemistry, Mathematics, History, and Psychology, while others, such as Biomolecular Science and Digital Arts & Sciences, integrate knowledge from several disciplinary areas to address recently emerging issues. All benefit from Clarkson's strengths in engineering and business, and all are focused on preparing students for graduate school, professional programs, and careers.

All Clarkson students complete the Clarkson Common Experience, which includes courses in science, mathematics, technology, and the humanities and social sciences. These are critical components of every degree program in the University, and through them students acquire the quantitative reasoning, critical thinking, and effective communication skills and the basic scientific knowledge that are essential in their major programs and in their development as responsible citizens, effective professionals, and technological leaders.

Our rapidly changing and increasingly complex world makes it desirable for students to extend their education beyond the boundaries of their particular major. The School of Arts & Sciences provides students in all areas of the University the opportunity to do so through its numerous minor programs.

Faculty

Biology

TBD, Chair. Professors: Tom Langen, Thomas Lufkin, Michael Twiss, Ken Wallace; Associate Professors: Stefanie Kring, Damien Samways, Shantanu Sur; Assistant Professors: Susan Bailey, Beatrice Hernout, Ginger Hunter, Petra Kraus, , Michelle Yoo; Adjunct Associate Professor: Ali Boolani, Jin Koh; Adjunct Assistant Professor: Deborah Brown; Adjunct Research Assistant Professor: Evie Brahmstedt; Emeritus Professor: Craig Woodworth

Chemistry and Biomolecular Science

Silvana Andreescu, Chair. Professors: Silvana Andreescu, Egon Matijević Endowed Chair, Costel Darie, Evgeny Katz, Milton Kerker Endowed Chair, Devon Shipp; Associate Professors: Daniel Andreescu, Galina Melman, James Peploski, Director of Freshman Chemistry, Mario Wriedt, Kodak CAMP Distinguished Professor; Assistant Professors: Ryan Brown, Melissa King, Ka Ho Leung, Xiaocun Lu; Visiting Assistant Professor Modi Wang;

Communication, Media and Design
Johndan Johnson-Eilola, Chair. Professors: Daved Barry, „ Jason Schmitt; Associate Professors: Alex Lee, Steven Pedersen; Assistant Professors: Erica Leigh, *Eric York; Visiting Assistant Professors: Colleen Murphy, Instructors:, Danielle Johns, Zachary Miller; Emeritus Professors: Stephen Doheny-Farina, William Dennis Horn, Bill Karis*

Computer Science
Alexis Maciel, Interim Chair. Professors: Christopher Lynch, Jeanna Matthews, Christino Tamon, Charles E. Thorpe; Associate Professors: Natasha Banerjee, Sanjib Banerjee, Alexis Maciel; Assistant Professors: Soumyabrata Dey. Emeritus Faculty. Professor: James Lynch; Instructor: Jan Searleman

Humanities and Social Sciences
Jerry W. Gravander, Interim Chair. Professors: Stephen Casper, Jonathan Goss, Alastair Kocho-Williams, Sarah Melville, Christopher Robinson, Annegret Staiger; Associate Professors: Jennifer Ball, Stephen Bird, Ellen C. Caldwell, Alexander Cohen, Laura E. Ettinger, Michael Garcia, Lisa Propst, JoAnn Rogers; Assistant Professors: Camille Frazier, Prashant Hosur Suhas, Matt Manierre, Blair Stein, Elisabeth Wulandari; Emeritus Professors: David M. Craig, Lewis P. Hinchman, John N. Serio, William Vitek, Sheila F. Weiss, Jan Wojcik

Mathematics
Joseph Skufca, Chair. Professors:„ Joseph Skufca; Associate Professors: Sumona Mondal, Guangming Yao; Assistant Professors: Prashant Athavale, Marko Budisic, Jonathan Martin, Diana White, Bin Xu, Emmanuel Asante-Asamani; Instructors: Christopher Martin, Sara Morrison, Brad Smith; Visiting Assistant Professor: D. Kumudu Arachchi

Physics
TBD, Chair. Professors: Daniel ben-Avraham, Michael Ramsdel, Dipankar Roy: Associate Professors: Maria Gracheva, Jan Scrimgeour, Joshua Thomas; Assistant Professors: Arzu Çolak, Dmitriy Melnikov, l, Dhara Trivedi; Emeritus Professors: M. Lawrence Glasser, Lawrence Schulman.

Psychology
Andreas Wilke, Chair. Professors: Andreas Wilke; Associate Professors: Lisa Legault; Assistant Professors: Lauren Petley, Elizabeth Pienkos, Ying Zhang; Emeritus Professor: Robert Dowman

BS In Applied Mathematics and Statistics

Joseph Skufca, Program Chair
jskufca@clarkson.edu

Applied mathematics is a problem-solving profession. Mathematical and statistical methods provide the tools for the analysis and solution of real-world problems which can be formulated quantitatively. While all technical fields require a solid foundation in mathematics, students of applied mathematics and statistics dig deeper, developing expertise both in mathematical methods and in the applications areas which interest them.

The BS in Applied Mathematics and Statistics is designed for students who wish to develop their mathematical skills and apply them to challenging problems. In addition to gaining a solid and broad education in applied mathematics and statistics, students also choose applications electives in areas of engineering, science, or business that give rise to significant applications of mathematics. The program is sufficiently flexible that students can also complete a minor or double major in another field, such as computer science, physics, biology, or business. Students are encouraged to participate in research projects with faculty, starting as early as their freshman year. Graduates work in industry, business, research laboratories, or government agencies as applied mathematicians, statisticians, and actuaries. Some continue their education in graduate programs in applied mathematics, statistics, or applications areas.

The applied math and statistics curriculum is designed so that students learn to:

1. Reason clearly, logically, and analytically;
2. Demonstrate a solid understanding of the core material and a deeper understanding of at least one area of mathematics;
3. Work effectively with standard mathematical software packages and write mathematical programs using a high-level computer language;
4. Apply mathematical knowledge to solve real-world, open-ended problems;
5. Read mathematical texts and literature and write mathematical proofs;
6. Communicate effectively, both orally and in writing; and
7. Work effectively both individually and in teams

In addition to the major in Applied Mathematics and Statistics, the Mathematics Department offers separate majors in:

1. Mathematics, with more emphasis on abstract mathematics and proof, including coursework that helps students to prepare for graduate study in math or statistics.
2. Data Science, which combines courses from mathematics, statistics, and computational science to help students develop the interdisciplinary, data-driven skill set needed to tackle real-world problems involving reasoning from vast volumes of data.

A student may not major in both Applied Mathematics and Statistics and either Mathematics or Data Science.

Program Requirements	
Area of study	**Credits**
Mathematics and Statistics*	44
Computer Science (CS 141)	4
Physics (PH 131 and PH 132)	8
Science (BY, CM, or PH)	3
First Year Seminar (FY 100)	1
The Clarkson Seminar (UNIV 190)	3
Knowledge Area/ University Courses	15
Application Electives**	15
Free Electives***	27
Total	120

**Required courses include MA 131, MA 132, MA 200, MA 211, MA 231, MA 232, MA 339, MA363, MA 377, MA 499, and STAT 383; three courses form the list MA 331, MA 332, STAT 381, STAT 382, STAT 384; plus either MA 451 or MA 453*
***Application Electives are chosen from an approved list of courses from other departments; check with the department for details*
****Up to 12 credit hours of advanced (300- or 400- level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the departments for details.*

Applied Mathematics & Statistics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
MA 131	Calculus I	3	MA 132	Calculus II	3
PH 131	Physics I	4	PH 132	Physics II	4
CS 141	Computer Science I	4	MA 200	Math Modeling & Software	3
UNIV 190	Clarkson Seminar	3		Knowledge Area Course	3
FY 100	First-Year Seminar	1		Free Elective (CS 142 rec.)	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
MA 211	Discrete Math and Proof	3	MA 231	Calculus III	3
MA 232	Differential Equations	3	MA 339	Applied Linear Algebra	3
	Science Elective	3	STAT 383	Probability and Statistics	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Application Elective	3		Application Elective	3
Total		15	Total		15

Applied Mathematics & Statistics Sample Curriculum					
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
MA 377	Numerical Methods	3	MA 363	Mathematical Modeling	3
	MA/ STAT Elective	3		MA/ STAT Elective	3
	Free Elective	3	MA 451/ MA 453	Intro to Math Research or Intro to Math Instruction	2
	KA University Course	3		KA/ University Course	3
	Application Elective	3		Application Elective	3
Total		15	Total		14
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	MA/ STAT Elective	3		MA/ STAT Elective	3
	Application Elective	3		Free Electives	12
	Free Electives	9	MA 499	Professional Experience	0
Total		15	Total		15

BS In Biology

TBD Program Chair

Biology is the study of life in all of its unique forms and complexity. Modern biology spans numerous research areas that explore the diversity of life at multiple levels of organization in the biosphere: molecules, cells, organ systems, species, and ecosystems. The foundation of the Biology Program is a core curriculum of interactive classroom and laboratory experiences that covers fundamental knowledge in biodiversity, cellular and molecular biology, genetics, microbiology, anatomy, physiology, and ecology. Biology majors typically pursue career paths in biotechnology, ecology and environmental science, or health-related professions. The course curriculum for the Biology Major is designed to realize the following outcomes:

1. Demonstrate proficiency in biology through mastery of the core knowledge of the discipline and specialization in one or more subfields of the life sciences.
2. Acquire scientific skills through inquiry-based laboratories and practical learning experiences that include the opportunity for directed study and thesis research guided by a professor.
3. Develop the ability to think critically and solve problems through exposure to quantitative laboratory- and field-based research, primary research literature, and the history of biological science.
4. Apply appropriate technology, methodology and informational tools that accelerate progress in the workplace such as computer software, bioinformatics, genetic engineering, cell culture, microscopy, etc
5. Master oral and written communication skills essential for work in all fields of biology and the health professions.
6. Develop social skills of interpersonal interaction including an awareness and appreciation of cultural diversity that enhances progress and enriches the pursuit of scientific endeavors
7. Gain strong appreciation of the importance of professional ethical behavior in society and the workplace
8. Convey insight of current issues of bioethical concern ranging from preservation of global biodiversity to the improvement of human health through modern advances in biotechnology
9. Learn about career opportunities in the life sciences in preparation for seeking professional employment after graduation

Upper-level Biology majors choose from a variety of elective courses that build upon fundamental principles and allow students to explore areas of personal interest. We encourage students to complement a program of bioscience courses drawn from research and teaching strengths of the department with relevant courses in other basic sciences, mathematics, engineering, business, and humanities. Students may also take advantage of courses offered through the Associated Colleges Program or the Clarkson

Trudeau Biomedical Scholars Program (see below) to broaden their educational experience. The large array of choices in biological sciences can be used to tailor a customized career plan leading to graduate school or a professional degree program. Students interested in a more specialized background may consider interdisciplinary studies in chemistry, biomolecular engineering, mathematics, physics, psychology, environmental engineering, environmental science and policy, and environmental and occupational health.

Specific course requirements of the Biology Major are listed below, along with a suggested schedule. Students are guided throughout the year with personal advising and mentoring by Biology faculty members. Undergraduate participation in basic or applied research is highly encouraged and available through work in faculty laboratories, the senior thesis, summer research programs, and internships.

Required Courses	
BY 140	Biology I: Inheritance, Evolution & Diversity (3 credits)
BY 142	Biology I Laboratory (2 credits)
BY 160	Biology II: Cell and Molecular Biology (3 credits)
BY 162	Biology II Laboratory (2 credits)
BY 214	Genetics (3 credits)
BY 401	Professional Assessment (0 credits)

Each of the following additional requirements must be satisfied:	
	Biology Electives (21-23 credits)
	Lab Electives (4-6 credits)
	Math and Computer Science Electives (9 credits) General and Organic Chemistry Electives (16 - 17 credits) Physics Electives (8 credits)
	Professional Experience (0 credits)

Elective Categories:

1. Biology electives are any course under the "BY" subject area
2. Students must take two BY lab courses (200-level or higher), excluding BY 405 and BY 410
3. Three math, statistics, or computer science courses (100-level or higher), including one calculus course and one statistics course
4. Two courses of general chemistry lecture and lab
5. Two courses of organic chemistry lecture (or equivalent) and at least two credits of organic chemistry lab
6. Two courses of physics lecture and lab
7. Professional experience is one of the following courses: BY 405, BY 410, BY 495, BY 498, BY 499

The following is a typical course sequence for the biology curriculum. Not all students will complete these courses in the outlined order.

Biology Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
BY 140	Biology I	3	BY 160	Biology II	3
BY 142	Biology I Lab	2	BY 162	Biology II Lab	2
CM 131	General Chemistry I	4	CM 132	General Chemistry II	4
MA 180	Intro to College	4	MA 181	Basic Calculus	3
UNIV 190	Clarkson Seminar	3		Knowledge Area Elective	3
FY 100	First-Year Seminar	1			
Total		17	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CM 241	Organic Chemistry I	3	BY 214	Genetics	3

PH 141	Physics for Life Sciences I	4	CM 242	Organic Chemistry II	3
	BY Lab Elective		PH 142	Physics for Life Sciences II	4
	Knowledge Area Elective		STAT 318	Biostatistics	4
Total		14-15	Total		14
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
	Biology Electives	6		BY Lab Elective	4-5
	Knowledge Area Electives	3		Biology Elective	3
	Math or Computer Science Elective	6		Technology Course	3
	Free Elective	3		Free Elective	3
Total		18	Total		13-14
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	Biology Elective	6		Biology Elective	6
	Knowledge Area Elective	3		Knowledge Area Elective	3
	Free Elective	3		Free Elective	3

	Professional Experience Elective	1	BY 401	Professional Assignment	0
Total		13	Total		12

BS In Biomolecular Science

Silvana Andreescu, Program Director
eandrees@clarkson.edu

Science has undergone a remarkable transformation over the last few years, and nowhere has the impact been as dramatic as at the interface between biology and chemistry – the bio-molecular sciences. Recent developments in biotechnology, biofuels, pharmaceuticals, genetic engineering and medicine have been truly astounding and will only continue throughout the 21st century. Few sciences will have an impact on our lives as much as this one, and few offer the opportunities for individuals to make such a broad variety of contributions. Clarkson University's program in Biomolecular Science is designed to:

1. Develop within the student a solid and comprehensive knowledge base to meet the challenges of professional careers spanning the full range of the chemical and biomolecular sciences.
2. Create an intellectually stimulating and experience rich learning environment, with exposure to open-ended problems frequently encountered in real-world situations, to prepare the student for industry positions, graduate school and professional programs in the health sciences.
3. Support and encourage the development of excellent communication tools and practice in forming professional relationships and skills.

This is an interdisciplinary program, building on strong foundations in both chemistry and biology, and finishing with capstone courses and labs in biochemistry, molecular biology and biotechnology. Professional and free electives allow students to build specializations in their own areas of interest and to participate in faculty-directed research, a "trademark" of science education at Clarkson.

Careers span the full range of the chemical and biological sciences, with exceptional opportunities in the pharmaceutical and medical industries, in biotechnology and genetic engineering, biofuels, forensics and the health sciences. The program at Clarkson is an excellent preparation for entrance into professional schools in medicine and dentistry, or for the Doctor of Physical Therapy or Physician Assistant programs at Clarkson. Our alumni have reported they are solidly prepared for the Medical College Admission Test and ready to meet the challenges of medical school.

Required Courses	
BY 140	Biology I: Inheritance, Evolution and Diversity (3 credits)
BY 160	Biology II: Cellular and Molecular Biology (3 credits)
BY 162	Biology II Laboratory (2 credits)
BY 214	Genetics (3 credits)
BY 412	Molecular Biology Laboratory (4 credits)
BY 450	Biochemistry I (3 credits)
BY 451	Biochemistry II (3 credits)
BY 470	Biochemistry & Biotechnology Laboratory (3 credits)
CM 103*	Structure and Bonding (3 credits)
CM 104*	Chemical Equilibrium and Dynamics (3 credits)
CM 105*	Chemistry Laboratory I (2 credits)
CM 106*	Chemistry Laboratory II (2 credits)
CM 221	Spectroscopy (3 credits)
CM 223	Spectroscopy Laboratory (3 credits)
CM 241	Organic Chemistry I (3 credits)
CM 242	Organic Chemistry II (3 credits)
CM 244	Organic Chemistry Laboratory I (3 credits)
CM 371	Physical Chemistry I (3 credits)
CM 372	Physical Chemistry II (3 credits)
MA 131	Calculus I (3 credits)
MA 132	Calculus II (3 credits)
PH 131	Physics I (4 credits)
PH 132	Physics II (4 credits)
*	***CM131*** *and* ***CM132*** *may be used to satisfy the first year chemistry requirement for the Biomolecular Science degree.*

Biomolecular Science Sample Curriculum *					
First Semester		**Credits**	**Second Semester**		**Credits**
CM 103	Structure and Bonding	3	CM 104	Equilibrium and Dynamics	3
CM 105	Chemistry Lab I	2	CM 106	Chemistry Lab II	2
MA 131	Calculus I	3	MA 132	Calculus II	3
BY 140	Biology I	3	BY 160	Biology II	3
UNIV 190	Clarkson Seminar	3	BY 162	Biology II Lab	2
FY 100	First-Year seminar	1		KA Elective	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CM 221	Spectroscopy	3	CM242	Organic Chemistry II	3
CM 223	Spectroscopy Lab	3	CM244	Organic Chemistry Lab	3
CM 241	Organic Chemistry I	3	BY 214	Genetics	3
PH 131	Physics I	4	PH 132	Physics II	4
	KA/UC Elective	3		KA/UC Elective	3
Total		16	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CM 371	Physics Chemistry I	3	CM372	Physical Chemistry II	3

BY 450	Biochemistry I	3	BY 451	Biochemistry II	3
	Statistics	3		Professional Elective	3
	Professional Elective	3		Professional Experience	3
	Free Elective	3		Free Elective	3
Total		15	Total		15
		Thesis Option			
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
BY 412	Molecular Biology Lab	4	BY 470	Biotechnology Lab	3
	KA/UC Elective	3		Professional Elective	3
CM491	Senior Thesis	6		Senior Thesis	6
	Free Electives	2			
Total		15	Total		12

**Students entering with AP credit or the addition of a minor or a 2nd major will make alternative course choices to meet their needs, therefore the curriculum shown is only an example. The curriculum will be discussed with the student's advisor before courses are selected for each semester.*

4+1 Plan for Masters of Basic Science (MBS) & Interdisciplinary Bioscience & Biotechnology (IBB-MS) MS Degree Programs

Objectives

Provide academically-strong Clarkson undergraduates a head-start and rapid track to a bioscience M.S. degree.

Outcomes

4+1 M.S. Degree Students will:

1. Complete all of the requirements and meet the outcomes of the M.S. graduate program in which they matriculate
2. Complete the M.S. degree after one year of additional classwork beyond the B.S. degree

Program prerequisites:

Students will apply in the junior year (5th or 6th semester) at Clarkson University.

Program requirements:

1. Either a Clarkson University Biology or Biomolecular Science Major or else another Clarkson University major that has taken the introductory biology core (BY 140, 142, 160, 162) and genetics (BY 214)
2. GPA minimum of 3.25 overall and for Biology courses
3. Likelihood of completing undergraduate degree requirements plus two additional graduate courses during the senior year (7th and 8th semesters)
4. Short essay explaining why the student is motivated to pursue a MS degree
5. Specification of which MS program the student plans to pursue

Program:

During the senior year (7th and 8th semesters), a student in the 4+1 MS program will take minimally three-credits (typically one course) graduate-level bioscience coursework each semester (500 or 600 level course with a BY designator). This graduate coursework will not count toward the undergraduate degree; it is in addition to the required 40 credits of BY designated coursework for the undergraduate degree. At the end of the senior year (upon graduation) the student will have completed at least 6 credits of the 30 credits required for a MS degree.

If the student has made adequate progress in the graduate coursework (grades B or better), the student will be immediately matriculated into the MS degree program and be granted graduate student status. During the 5th year (9th and 10th semesters), the student will be expected to complete all additional coursework and research/ project requirements of the graduate program (MBS or MS-IBB). This will require 12 credit hours each of the two semesters to complete the degree requirements.

BS In Chemistry

Silvana Andreescu, Program Chair
eandrees@clarkson.edu
James Peploski, Director of Freshman Chemistry
jpeplosk@clarkson.edu

Chemistry is the most central of sciences. It deals with the properties, composition and structure of matter, with the changes that occur in matter and with energy relationships involved in those changes. Chemistry has been at the forefront of virtually all recent advances in materials, medicine and renewable fuels. The chemistry program at Clarkson has been designed to:

1. Develop within the student a solid and comprehensive knowledge base to meet the challenges of professional careers spanning the full range of the chemical sciences.
2. Create an intellectually stimulating and experience rich learning environment, with exposure to open-ended problems frequently encountered in real-world situations, to prepare the student for industry positions, graduate school and professional programs.
3. Support and encourage the development of professional relationships and excellent communication tools and skills.

It is a rigorous degree program and students completing their requirements may receive a degree certified by the American Chemical Society if so desired. At the same time, it has the flexibility to allow students to develop the specialties that best meet their career goals.

The small laboratory learning environment provides regular interaction between students and instructors in the laboratory setting, which offers students research experiences as well as ample opportunities to develop communication skills through small group presentations and reports. The chemistry faculty are internationally known for the quality of their research, and undergraduates are encouraged to become involved in research with the faculty and graduate students as early as their freshman year.

A major in chemistry provides an excellent foundation for careers in chemical research & development, forensics, product development, toxicology, environmental protection and the health related fields. Pre-health sciences advising programs are available for students interested in medical school or health-care fields. A pre-PT undergraduate concentration is available, preparing students for entry into the Doctor of Physical Therapy degree program. A pre-PA concentration leading to the Masters of Physician Assistant Studies degree program is also available.

Required Courses	
CM 103/ CM 105 *	Structure and Bonding with Lab
CM 104/ CM 106 *	Equilibrium and Dynamics with Lab
CM 121	Freshmen Seminar
CM 221/ CM 223	Spectroscopy with Lab
CM 241/ CM 242	Organic Chemistry I and II
CM 244	Organic Chemistry Lab
CM 300	Instrumental Lab
CM 312	Inorganic Chemistry
CM 320	Separations and Electrochemistry
CM 345	Advanced Lab
CM 371/ CM 372	Physical Chemistry I and II
PH 131/ PH 132	Physics I and II
MA 131/ MA 132	Calculus I and II
MA 232	Differential Equations
*	***CM131*** *and* ***CM132*** *may be used to satisfy the first year chemistry requirement for the Chemistry BS degree.*

Chemistry Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CM 103	Structure and Bonding	3	CM 104	Equilibrium and Dynamics	3
CM 105	Chemistry Lab I	2	CM 106	Chemistry Lab II	2
MA 131	Calculus I	3	MA 132	Calculus II	3
EV 100	Intro to Environmental Sci	1	PH 131	Physics I	4
UNIV 190	Clarkson Seminar	3	CM 121	Freshmen Seminar	1
FY 100	First-Year Seminar	1		KA Elective	3
Total		13	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CM 221	Spectroscopy	3	CM 242	Organic Chemistry II	3
CM 223	Spectroscopy Lab	3	CM 244	Organic Chemistry Lab	3
CM 241	Organic Chemistry I	3		KA/UC Elective	3
MA 232	Differential Equations	3	PH132	Physics II	4
	KA/UC Electives	3		Statistics Elective	3
Total		15	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CM 345	Advanced Laboratory	4	CM 300	Instrumental Laboratory	3

CM 371	Physical Chemistry I	3	CM 312	Survey of Inorganic Chemistry	3
CM 320	Separations and Electrochemistry	3	CM 372	Physical Chemistry II	3
	Professional Experience	3		KA/UC Elective	3
	Free Elective	3		Biology Courses	3
Total		16	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	KA/UC Elective	3		Free Electives	14
	Free Electives	12			
Total		15	Total		14
Thesis Option					
Seventh **Semester**		**Credits**	Eighth **Semester**		**Credits**
CM 491	Undergraduate Thesis	6	CM 492	Undergraduate Thesis	6
	KA/UC Elective	3		Free Electives	8
	Free Electives	6			
Total		12	Total		14

**Students entering with AP credit or the addition of a minor or a 2nd major will make alternative course choices to meet their needs, therefore the curriculum shown is only an example. The curriculum will be discussed with the student's advisor before courses are selected for each semester.*

Those students wishing to satisfy the requirements for an American Chemical Society (ACS) certified BS degree will need at least six credit hours in advanced chemistry electives, including Biochem I, and at least one credit hour of an elective chemistry laboratory course. Directed research can count for only three such credits.

BS In Communication, Media & Design

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Students in Clarkson's Communication, Media & Design degree develop a repertoire of communication, media production, and design skills with a solid understanding of theory and practice. Together, these prepare students to pursue professional careers or graduate programs in many dynamic fields.

Starting with a set of six required courses, students develop abilities which are the foundation of any successful 21st century career in communication: writing, speaking, graphic design, media production, teamwork and communication theory. Students then enhance and deepen these abilities through six additional communication courses, which can be focused in areas like new media, UX Design, video production, or online content creation. Students may select specific courses or, in conjunction with Communication, Media & Design faculty, create independent study projects to further personal and professional interests. Our faculty takes advantage of Clarkson's technological environment to provide instruction in writing, speaking, graphic design, digital video and audio production, web design, information design, usability testing, public relations, environmental communication, and social media. Students work with our faculty in experiential learning projects, ongoing research activities, and regular classes to learn, design and experiment with the latest communication technologies. The Communication, Media & Design program at Clarkson has been designed to develop

- a student's informative and persuasive communication skills
- a student's skills in digital media production
- a student's mastery of design across a variety of types
- a student's ability to work effectively and ethically in the professional workplace
- a student's ability to critically analyze language and media use in society and the workplace

Requirements for BS in Communication, Media & Design

Communication, Media & Design majors must take:

1. Six required COMM courses:
    1. COMM 210 Rhetoric for Business, Science, and Engineering
    2. COMM 217 Introduction to Public Speaking
    3. COMM 300 professional communication course
    4. COMM 400 chosen from lists maintained by the Communication, Media & Design Department
    5. COMM 490 Communication Internship
    6. COMM 499 Senior Project
2. Six other elective COMM courses, such as:
    1. COMM 100 2D Digital Design
    2. COMM 219 Intro to Social Media
    3. COMM 229 Principles of User-Experience Design
    4. COMM 310 Mass Media & Society
    5. COMM 327 Digital Video 1
    6. COMM 322 Typography & Design
    7. COMM 329 Front-End Development for the Web
    8. COMM 360 Sound Design
3. Substantial exposure to mathematics, science, technology, computing, and liberal arts.
4. 15 credit hours in an external field (e.g. computer science, digital arts, history, business, information technology, psychology) which provides them with a secondary field for further personal or professional development.

Students can use the remaining credits required for graduation to pursue individual interests or career goals.

COMM 490 (Advanced Communication Internship) serves as a bridge to industry or to advanced study in the field. Students complete their internship by doing professional communication work for offices on campus or for off-campus businesses and organizations.

COMM 499 (Senior Project) requires students to plan and complete a complex, large communication project over the course of a full semester with ongoing feedback from peers and faculty. The course culminates in an exhibition during commencement week.

Students may earn a double major by fulfilling the requirements for the BS in Communication and another discipline at Clarkson, often without overload coursework. Students pursuing other majors may acquire a minor in Communication.

Along with meeting the requirements of the Clarkson Common Experience, Communication, Media & Design majors must fulfill the following requirements:

1. Communication, Media & Design requirements (36 credit hours)
2. General requirements (26 credit hours)
3. Mathematics courses (including STAT 282)
4. Science courses (including lab courses)
5. Computer courses, additional Math, Science, or Computer Science courses
6. FY 100, First-year seminar
7. External field (15 credit hours):
   Five courses to be chosen in consultation with advisor in a subject area outside the Communication, Media & Design major

Students choose the remaining hours to

- fulfill remaining Knowledge Areas
- take additional Communication courses
- take additional liberal arts, engineering, business, or science courses
- pursue another external field
- transfer credit from junior and community colleges
- earn a double major
- design individual areas of study

The Communication, Media & Design program is designed to be flexible. In most cases, students work closely with faculty to arrange an appropriate sequence of courses. The following eight-semester plan is typical only in that it indicates students should take the general requirements before pursuing the external field requirement. Since all courses are not offered each semester, and since some courses in the external field may have prerequisites, students should seek guidance from the Communication, Media & Design department in planning their academic programs.

Communication Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
COMM 210	Rhetoric for Business, Science, and Engineering	3		COMM Elective	3
UNIV 190	The Clarkson Seminar	3	STAT 282	General Statistics	3
MA 180	Intro to college math	4	BY 115	Nat. Science Elective	3
COMM 217	Public Speaking	3		COMM Elective	3

FY 100	First-Year Seminar	1		Elective (UNIV KA)	3
Total		14	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
	COMM Elective	3	COMM 3xx	From CM&D List	3
BY 110/112	Nat. Science Elective with Lab	4		COMM Elective	3
	External Field Class	3		External Field	3
	Computer Elective (TECH)	3		Elective (KA)	3
	Elective (KA)	3		Elective	3
Total		16	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
COMM 4xx	From CM&D List	3		COMM Elective	3
	Computer Elective	3		MA/SC/Computer Elective	3
	COMM Elective	3		External Field	3
	External Field Class	3		Elective (KA)	3
	Elective (KA)	3		Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	COMM Elective	3		Free Electives/COMM Electives	12

COMM 490	Communication Internship	3	COMM 499	Senior Project	3
	External Field Class	3			
	Electives	6			
Total		15	Total		15

BS In Computer Science

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Computer technology plays a critical role in virtually every business and institution. It is an essential tool in every branch of science and engineering. Many forms of arts and entertainment are centered on computer technology. Computer scientists are professionals who understand the technology and have the skills to develop and apply it.

Many computer scientists work as software developers who design, implement, test and maintain computer software. They can also work as information technology specialists who deploy and manage information technology, including computer systems, computer networks, database systems and web technology. Some are researchers who invent new technology or study its theoretical foundations.

The Computer Science major is organized into four options. The General option is the most flexible. It allows students to tailor their program of study to a wide variety of professional and personal goals. The other three options prepare students for the specific career paths mentioned above: Software Design and Development, Information Technology and Research. The requirements of the General option are shown below. The first five semesters of the sample schedule shown below are common to all options of the CS major.

The Computer Science major is designed so that by the time they graduate, students should be able to:

1. Demonstrate a solid understanding of the core concepts of computer science and some advanced topics in computer science;
2. Reason clearly and analytically about software and computing systems;
3. Work effectively with a variety of programming languages, software tools, and computing environments;
4. Solve substantial real-world problems;
5. Communicate effectively orally and in writing;
6. Work effectively in teams; and
7. Use computer science literature and other similar resources for independent study or to research the solution to a computing problem

In addition to the general undergraduate requirements, students majoring in Computer Science must complete the following:

Required Courses	
CS 141*	Introduction to Computer Science I (4 credits)
CS 142*	Introduction to Computer Science II (3 credits)
CS 241*	Computer Organization (3 credits)
CS 242*	Advanced Programming Concepts in Java (3 credits)
CS 341	Programming Languages (3 credits)
CS 344	Algorithms and Data Structures (3 credits)
CS 345	Automate Theory and Formal Languages (3 credits)
CS 350	Software Design & Developments (3 credits)
CS 444	Operating Systems (3 credits)
CS 499	Professional Experience (0 credits)
MA 131	Calculus I (3 credits)
MA 132	Calculus II (3 credits)
MA 211	Discrete Mathematics and Proof (3 credits)
MA 339 OR MA 239	Applied Linear Algebra (3 credits) Elementary Linear Algebra (3 credits)
STAT 383 OR MA 381	Probability and Statistics (3 credits) Probability (3 credits)
Science Electives	One 2-course lecture/ lab sequence in CM or PH, plus 4 additional credits in CM, PH, or BY (12 credits)
CS Electives I	Three advanced CS courses** (9 credits)
CS Electives II	Two advanced courses in CS or related disciplines** (6 credits)

**Or equivalent*
***Chosen from a list maintained by the department.*

Up to 12 credit hours of advanced (300- or 400- level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the department for details.

The following is a typical course sequence for the computer science curriculum. Not all students will complete these courses in the outlined order.

Computer Science Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CS 141	Intro to Comp Sci I	4	CS 142	Intro to Comp Sci II	3
MA 131	Calculus I	3	MA 132	Calculus II	3
	Science Sequence Course I	4		Science Sequence Course II	4
UNIV 190	The Clarkson Seminar	3		Knowledge Area Course	3
FY 100	First-Year Seminar	1		Free Elective	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CS 242	Advanced Programming Concepts	3	CS 241	Computer Organization	3
CS 341	Programming Languages	3	CS 344	Algorithms and Data Structures	3
MA 211	Discrete Math and Proof	3	CS 350	Software Design and Development	3
	Science Elective	4	MA 339	Applied Linear Algebra	3
	Knowledge Area Course	3		Knowledge Area Course	3
Total		16	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CS 345	Automata Theory	3	CS 444	Operating Systems	3
	CS Elective	3		CS Elective	3
STAT 383	Probability and Statistics	3		Knowledge Area Course	3
	Knowledge Area Course	3		Free Elective	3
	Free Elective	3		Free Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	CS Electives	3		CS Electives	6
	Free Electives	12		Free Electives	9
CS 499	Professional Experience	0			
Total		15	Total		15

BS In Data Science

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Across business, industry, government, and nearly all scientific efforts, the explosion of data and data collection drives a growing need to manage, analyze, and extract insight and knowledge from the data produced. Not only must scientists and engineers grapple with Political Science vast volumes of data, but throughout business and industry, from entry-level technician to executive, the ability to reason effectively using data continues to grow in importance. The skillset required to excel in that environment lies at the intersection of mathematics, statistics, and computational science. The emerging discipline of *Data Science* addresses that interdisciplinary space, and the National Academy of Science, Engineering, and Medicine (NASEM) has identified this discipline as a critical enabler for tackling many real-world problems.

The BS in Data Science provides students the opportunity to develop an interdisciplinary, data-focused skillset and then apply those skills to real-world challenges. The program provides strong preparation in critical aspects of working with data by thorough grounding in mathematics and statistics and the foundations of computer science as related to data and data processing. The program provides an early focus on foundational competencies across the spectrum of the science of data. Once that baseline is established, students are expected to apply those skills in specific domains of interest to them, with a significant component of the curriculum based on team projects and experiential learning.

The data science curriculum prepares students to:

1. Apply analytic thinking and quantitative reasoning skills to relevant problems;
2. Demonstrate the ability to communicate technical results with clarity and precision;
3. Understand a number of computer programming constructs and develop the ability to quickly assimilate the skills required to use new and emerging programming languages;
4. Solve real-world, open-ended problems;
5. Explore at least one area of application-specific domain knowledge;
6. Work effectively both individually and in teams;
7. Understand the ethical implications of data-driven methods in the modern, data-enabled society

In addition to the major in Data Science, the Mathematics Department offers separate majors in:

1. Mathematics, with more emphasis on abstract mathematics and proof, including coursework that helps students to prepare for graduate study in math or statistics.

2. Applied Mathematics and Statistics, which provides a broader range of courses applicable to many business, engineering, and industrial math applications.

A student may not major in both Data Science and either Applied Mathematics and Statistics or Mathematics.

The courses from these other majors are available to the Data Science major. Interested students can leverage these other offerings to prepare themselves across the full spectrum of opportunities in the mathematical sciences.

Required Courses
Mathematics and Statistics* (35 credits)
Data Science (DS 241, DS 392) (6 credits)
Computer Science (CS 141, CS 142, CS 344, CS 449) (13 credits)
Science** (BY, CM or PH) (8 credits)
Information Systems (IS 314, IS 415, IS 426) (9 credits)
First-Year Seminar (FY 100) (1 credit)
The Clarkson Seminar (UNIV 190) (3 credits)
Knowledge Area/ University Courses (15 credits)
Application Electives*** (6 credits)
Free Electives**** (24 credits)

**Required courses are: MA 131, MA 132, MA 200, MA 211, MA 231, MA 339, MA 499, and STAT 381, STAT 382, STAT 383, STAT 384, STAT 385, STAT 488 (2 credits).*
***Science requirements must include at least two courses with labs*
****Application Electives are course from outside the MA, STAT, CS, and IS course designations that provide depth of knowledge in some domain. Students must take two 3-credit courses at the 200 level or higher, both from the same subject area, with the particular pairing approved by the Mathematics Department.*
*****Up to 12 credit hours of advanced (300- or 400- level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the Mathematics Department for details.*

Data Science Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CS 141	Intro to Comp Sci I	4	CS 142	Intro to Comp Sci II	3
MA 131	Calculus I	3	MA 132	Calculus II	3
UNIV 190	Clarkson Seminar	3	MA 200	Math Modelling and Software	3
FY 100	First-Year Seminar	1		Knowledge Area Course	3
	Science Elective	4		Science Elective	4
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
DS 241	Intro to Data Science	3	CS 344	Algorithm and Data Structure	3
IS 314	Database Design and Management	3	IS 415	Data Warehousing for Analytics	3
MA 211	Discrete Math and Proof	3	MA 231	Calculus III	3
STAT 383	Probability and Statistics	3	MA 339	Applied Linear Algebra	3
	Knowledge Area Course	3		Knowledge Area Course	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CS 449	Computational Learning	3	DS 392	Ethics of Data Analytics	3
IS 426	Big Data Architecture	3	STAT 382	Mathematical Statistics*	3
STAT 381	Probability	3		Knowledge Area/ University Courses	3

	Knowledge Area/ University Course	3		Free Electives	6
	Free Elective	3			
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
MA 499	Professional Experience	0	STAT 384	Advanced Applied Statistics	3
STAT 385	Bayesian Data Analysis	3	STAT 488	Statistics Projects	2
	Application Elective	3		Application Electives	3
	Free Electives	9		Free Electives	6
Total		15	Total		14

**STAT 382 and STAT 384 are offered alternating years; third and fourth year students take whichever course is offered during that particular semester.*

BS In Digital Arts and Sciences

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Embracing the possibilities offered by new and emerging digital technologies, the BS degree in Digital Arts & Sciences (DA&S) prepares students for the growing number of career opportunities that combine creative engagement with technical proficiency and scientific understanding. DA&S takes a holistic and multidisciplinary approach that allows students to critically and creatively navigate the intersections of art and science. Possible career paths span a wide range of fields, including video game design and production; film, animation, and motion graphics; application design and development; scientific visualization and simulation; interactive display systems; extended reality and immersive experience design, and new media art.

Students take advantage of courses in digital art, math, computer science and communication, media and design. The program's objective is to combine artistic and scientific skills and interests to develop creative talent with a strong technical foundation.

The curriculum for the Digital Arts and Sciences Major is designed to achieve the following outcomes:

1. Develop a strong interdisciplinary foundation in the digital arts, mathematics, and computer science fields;
2. Specialize in one or more areas of advanced study in the program;
3. Acquire artistic and scientific skills through project-based assignments that include the opportunity for directed study and thesis projects guided by a professor;
4. Experience working in a collaborative, team-based atmosphere for large-scale projects that are designed to emulate the real-world situations and problems;
5. Learn how to utilize technological, traditional and experimental methods of creative and analytical problem-solving;
6. Master oral, visual, and written communication skills essential for work in all fields of the arts and sciences;
7. Learn about career opportunities in the arts and sciences in preparation for seeking professional employment or advanced academic study after graduation;
8. Create a portfolio of artistic and scientific research which demonstrates the knowledge gained as a student in the program

DA&S students benefit from small classes and personal attention. The DA&S major is strengthened by Clarkson's technology-rich environment. Students have access to state-of-the-art facilities and experiences such as:

1. Media Production Computer Lab
2. Usability Testing Laboratory
3. Extended Reality Discovery Laboratory
4. 360 Immersive Video Dome
5. Clarkson Open Source Institute
6. Industry-standard Applications for Media Art & Interactivity
7. Digital Arts Visualization Lab
8. Digital Arts Experimental Studio
9. Digital Arts Project Space
10. Digital Video and Audio Production Equipment
11. 2D & 3D Printing Technology
12. Audio Production Studio
13. Motion Capture Equipment
14. Field Trips to International Digital Arts Festivals, Conferences and Companies
15. Innovation Hub Dorf Makerspace
16. Innovation Hub Digital Making Suite

DA&S students develop their research and creative abilities through an extensive portfolio development process spanning multiple semesters. The culminating capstone experience requires each DA&S student to utilize their specialist areas of interest, creative abilities, and technical prowess, developed over their time in the program, to create a final project intended for public presentation or exhibition.

The capstone project and related portfolio will tangibly demonstrate a student's skills and potential, and will prove to be a key first step in leading to job opportunities and/or entry to graduate school. In addition to the general undergraduate requirements (see below*), students majoring in Digital Arts & Sciences must complete the following:

Required Courses	
DA 100	Introduction to Digital Art: Time and Image (3 credits)
DA 110	Drawing (3 credits)
DA 120	Element of Design (3 credits)
DA 140	Introduction to Digital Art: Form & Code (3 credits)
DA 212	Art in Context (3 credits)
2 x DA 2xx level or higher	DA Electives (6 credits)
2 x DA 3xx level or higher	DA Electives (6 credits)
DA 491	Professional Practice (3 credits)
DA 492	Senior Studies (3 credits)
CS 141 (TECH)	Intro to Computer Science I (4 credits)
CS 142	Intro to Computer Science II (3 credits)
CS 242	Advanced Programming Concepts in Java (3 credits)
MA 131	Calculus I (3 credits)
MA 230	3D Space and Projective Geometry (3 credits)
MA 239	Linear Algebra (3 credits)
MA 277	Elementary Numerical Methods (3 credits)
3 x MA/CS	Electives (9 credits)
General Undergraduate Requirements	
STAT 282/ 381/ 383	Probability and Statistics (3 credits)
PH 131/ 141	Science course with lab PH 131/ 141 required (4 credits)

NAT SCI	Science Course (3 credits)
Electives	Free Electives* (42 credits)
UNIV 190	The Clarkson Seminar (3 credits)
FY 100	First Year Seminar (1 credit)

**Free electives will cover Knowledge Area courses as needed.*

Students must also meet the Common Experience requirements for communication points and a technology course, though it is anticipated that the required courses will satisfy these. MA 231 Calculus III satisfies the MA 230 requirement for double majors or changes of major.

Digital Arts and Sciences Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
DA 110	Drawing	3	DA 100	Intro to Digital Art	3
DA 120	Elements of Design	3	DA 140	Intro to Digital Art: Form and Code	3
MA 131	Calculus I	3	MA/CS	MA/CS Elective	3
UNIV 190	The Clarkson Seminar	3	PH131/141	Physics I	4
FY 100	First Year Seminar	1		Elective	3
Total		13	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CS 141	Intro to Comp Sci I	4	MA 239	Elementary Linear Algebra	3
DA 212	Art in Context	3	DA 2xx	200 Level DA course or above	3
DA 2xx	200 level DA course or above	3	MA 230	3D Space & Projective Geometry	3
MA/CS	MA/CS Elective	3	Nat Sci	Natural Science no Lab required	3
	Elective	3		Elective	3
Total		16	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CS 142	Intro to Comp. Sci II	3	Da 3XX	300 level DA course or above	3
DA 3xx	300 level DA course or above	3	MA/CS	MS/CS Elective	3
MA 277	Elementary Numerical Methods	3	STAT 282	General STAT	3
	Elective	3		Elective	3
	Elective	3		Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
DA 491	Professional Experience	3	DA 492	Senior Studies	3
CS 242	Advanced Java	3		Elective	3
	Elective	3		Elective	3
	Elective	3		Elective	3
	Elective	3		Elective	3
Total		15	Total		15

BS In History

TBD Program Chair

History examines human experience, confronting students with facets of human life in the past and in the present. The history major at Clarkson provides students with the opportunity to learn about lives, times, and places distant from their own, and it provides them with the tools to think about them critically.

Students majoring in History will:

1. Appreciate history as an interpretive discipline
2. Have a broad understanding of history
3. Demonstrate mastery of appropriate research methodologies in history by producing a capstone research paper
4. Gain expertise in using technology to explore historical problems

History majors work closely with their advisors to develop a coherent program of study. In addition to courses in American History and Gender & Sexuality studies, students have the unique opportunity to develop areas of expertise generally unavailable at liberal arts colleges, by taking sets of history courses focused on Science, Medicine, Technology, and Society; War Studies; and the Ancient, Medieval and Renaissance World. Through their History major at Clarkson, students will also gain the ability to:

1. Write clearly and persuasively
2. Speak effectively in a group setting
3. Think critically
4. Understand and analyze complex problems
5. Examine and interpret evidence
6. Organize and synthesize large amounts of information
7. Approach current issues with historical perspective

Requirements for BS in History

120 credit hours, including:

1. 1 credit Introduction to the Liberal Arts pre-seminar
2. 9 courses in history, including:
    3. 6 courses at the 300-level or above
    4. 1 course in pre-modern history
    5. 1 course in modern history
6. Humanities/ Social Sciences Research Seminar
7. 5 courses external to the major concentration
8. Fulfillment of the requirements of the Clarkson Common Experience

Students majoring in History are required to take at least five courses in an external field,. The external field is a coherent group of five related courses outside the student's

major field -- in effect, a minor. The external field can be taken in any department, including HUSS. Finally, history majors will be encouraged to:

1. Study abroad. Students who study abroad should take at least one course in the history of their host country
2. Do historical internships, for example, at local historical museums

Courses taken to fulfill requirements for a Humanities/ Social Sciences Major cannot be used to fulfill requirements for a Humanities and Social Sciences minor.

History Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
HSS 120	Introduction to Liberal Arts	1	STAT 282	Statistics	3
UNIV 190	The Clarkson Seminar	3		History Major Course	3
FY 100	First Year Seminar	1		Science Requirement	3
	Math Requirement	4		Knowledge Area Course	3
	History Course 200 Level	3		Pre-professional concentration or free elective	3
	Free Elective	3			
Total		15	Total		15

Third Semester		**Credits**	**Fourth Semester**		**Credits**
	History Major Course	3		History Major Course	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Pre-professional concentration	3		Pre-professional concentration	3
	Science Requirement	4		Free Elective	3
	Free Elective	3		Free Elective	3

Total		16	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
	History Major Course	3		History Major Course	3
	History Major Course / Free Elective	3		History Major Course/ Free Elective	3
	Knowledge Area/ University Course	3		Knowledge Area/ University Course	3
	Pre-professional concentration	3		Pre- professional concentration	3
	Free Elective/ Technology Serving Humanity Course	3		Free Elective/ Technology Serving Humanity Course	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	HSS Research Seminar (C2) / History Major Course	3		HSS Research Seminar (C2) / History Major Course	3
	Pre-professional concentration / Free Elective	3		Free Elective	3
	Knowledge Area / University Course	3		Free Elective	3
	Free Elective	3		Free Elective	3
	Free Elective	3		Free Elective	3
Total		15	Total		15

BS In Interdisciplinary Liberal Studies, and Interdisciplinary Social Sciences

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Clarkson offers interdisciplinary Bachelor of Science degrees inSocial Sciences and Liberal Studies. Students can also minor in these areas, as well as in interdisciplinary thematic areas.

The Interdisciplinary Social Sciences and Interdisciplinary Liberal Studies programs challenge students to think critically and incisively about ideas, people, society and the human condition. Students learn about, think about, and come to understand the issues and problems of the contemporary world and of the past. They learn about the diversity and the complexity of social life, past and present. They learn how the human condition and human experience have been captured in literature and art. And they learn the ways in which people have sought to understand their lives through philosophical inquiry.

These degree programs offer a great deal of flexibility, allowing a student substantial elective choice. Each student works closely with an advisor to select both major and elective courses that meet his or her educational and career goals. Students minoring in the department also choose the courses in their programs in consultation with their advisors. Courses in the Interdisciplinary Social Sciences, Humanities or Liberal Studies majors at Clarkson offer students intellectually challenging opportunities to help them:

1. Gain critical perspectives on themselves and the world
2. Understand the complexities of open-ended human problems
3. Achieve awareness of cultural and social diversity
4. Assess the ethical and social implications of science, technology, and business
5. Engage in and appreciate the creative process

Through their Interdisciplinary Social Science, Humanities or Liberal Studies major at Clarkson, students will also gain the ability to:

1. Write clearly and persuasively
2. Speak effectively in a group setting
3. Think critically
4. Understand and analyze complex problems
5. Examine and interpret evidence
6. Organize and synthesize large amounts of information

Requirements for BS

A total of 120 credit hours, comprising:

1. 1 credit introduction to the Liberal Arts pre-seminar
2. 8 courses with an appropriate topical or thematic focus
3. The Humanities/ Social Sciences Research Seminar
4. 5 courses external to the major concentration

5. Fulfillment of the requirements of the Clarkson Common Experience

Students majoring in interdisciplinary Social Science, Humanities or Liberal Studies at Clarkson are required to take at least five courses in anexternal field. The external field is a coherent group of five related courses outside the student's major field -- in effect, a minor. The external field can be taken in any department, including HUSS.

Courses taken to fulfill requirements for a Humanities/ Social Sciences Major cannot be used to fulfill requirements for a Humanities and Social Sciences Minor.

Interdisciplinary Liberal Studies and Social Sciences Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
HSS 120	Introduction to Liberal Arts	1	STAT 282	Statistics	3
UNIV 190	The Clarkson Seminar	3		Pre-Professional Concentration/ Free Elective	3
FY 100	First-Year Seminar	1		Science Requirement	3
	Math Requirement	4		Knowledge Area Course	3
	Major Course*	3		Major Course*	3
	Free Elective	3			
Total		15	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
	Major Course*	3		Major Course*	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Pre-professional concentration	3		Pre-professional concentration	3
	Free Elective	3		Free Elective	3
	Science Requirement	4		Free Elective	3
Total		16	Total		15

Fifth Semester		Credits	Sixth Semester		Credits
	Major Course*	3		Major Course* or Free Elective	6
	Major Course*/ Free Elective	3		Knowledge Area/ University Course	3
	Knowledge Area/ University Course	3		Pre-professional concentration	3
	Pre-professional concentration	3		Free Elective/ Common Experience Technology Serving Humanity Course	3
	Free Elective/ Common Experience Technology Serving Humanity Course	3			
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	HSS Research Seminar (C2) / Major Course*	3		HSS Research Seminar (C2) or Major Course*	3
	Pre-Professional Concentration / Free Elective	3		Free Electives	12
	Knowledge Area / University Course	3			
	Free Elective	6			
Total		15	Total		15

*Major courses are those designated Anthropology, Film, History, Literature, Philosophy, Political Science, Social Sciences, Science Technology and Society Sociology.

Concentration in Gender and Sexuality Studies

The Concentration in Gender & Sexuality studies is a curricular option available within either the BS in Interdisciplinary Social Sciences or the BS in Interdisciplinary Liberal Studies degree programs. To complete this concentration, all students must:

1. Satisfy the requirements for the BS in Interdisciplinary Social Sciences or the BS in Interdisciplinary Liberal Studies degree programs (10 courses in the major – One introduction to Liberal Arts, one Major Research Seminar, and eight content courses)
2. Take 15 credit hours (five courses) in Gender and Sexuality Studies, structured as follows:
    3. Students must take SS 220, Introduction to Gender, or SS 221, Introduction to Sexuality, as well as four courses from an approved list of Gender and Sexuality Studies courses maintained by the Humanities and Social Sciences department.
    4. Three of the five Gender and Sexuality Studies courses may be used to substitute for three of the required content courses in the major. The other two Gender and Sexuality Studies courses may be used to satisfy undesignated electives.

Students who complete the Gender and Sexuality Studies Concentration will have this noted on their transcripts.

BS in Literature

Jerry W. Gravander, Interim Program Chair
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Program Goals

Our courses examine the human condition and experience as captured in literature and film. The Literature major at Clarkson provides students with the opportunity to explore works of literature and film from diverse cultures and perspectives, and it provides them with the tools to think about them critically

Program Outcomes

Through their Literature major at Clarkson, students will also gain the ability to:

Write clearly and persuasively with a particular purpose and audience in mind
Speak effectively in a group setting
Understand and communicate complex ideas clearly
Think critically
Closely read and critically interpret texts and films

Literature majors work closely with their advisors to develop a coherent program of study. Studying literature at a university that cultivates innovative thinking and practical applications for creative ideas can help students bridge the gap between theory and practice as they explore the varied applications of their studies. Moreover, by studying literature in an interdisciplinary department at a STEM-focused university where students are required to take courses in an external field, students are consistently exposed to opportunities to connect information and ideas across disciplines, a skill critical to big-picture thinking.

Learning Objectives

Students majoring in Literature will gain:

An understanding of literature as an interpretive discipline and aesthetic form
An understanding of film as an interpretive discipline and aesthetic form
An understanding of the multiple levels of context in which words and texts are meaningful
Mastery of appropriate research methodologies and critical frameworks in literature and film by producing a capstone research paper

Program Requirements

120 credit hours, including:

1. HSS 120: Introducing the Liberal Arts
2. HSS 480: Major Research Seminar
3. 9 courses in literature and film, of which at least 2 must be LIT courses (that is, have the LIT
   designator) and at least 2 must be FILM courses.
4. 5 courses external to the major concentration

Fulfillment of the requirements of the Clarkson Common Experience

Students majoring in Literature are required to take at least five courses in a an external field. The external field is a coherent group of five related courses outside the student's major field -- in effect, a minor. The external field can be taken in any department, including HUSS.

Finally, literature majors will be encouraged:

To Study Abroad: students who study abroad should take at least one course in the literature or film of their host country.

To do an Internship, with the aim of exploring available career paths. The internship is a valuable opportunity to explore career paths that do not relate directly to literature but for which the broad liberal education of a literature major will have prepared students by endowing them with critical reading and writing skills, analytic thinking, creative expression, ability to take diverse perspectives, familiarity with other cultures, and the ability communicate complex ideas clearly. These skills are transferable across multiple domains, fields, industries, careers, and professions.

Literature Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
HSS 120	Introduction to Liberal Arts	1	STAT 282	Statistics	3
UNIV 190	The Clarkson Seminar	3		Pre-Professional Concentration/ Free Elective	3
FY 100	First-Year Seminar	1		Science With Lab Requirement	4
	Math Requirement	4		Knowledge Area Course	3
	Literature Major Course	3		Literature Major Course	3
	Free Elective	3			
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
	Literature Major Course	3		Literature Major Course	3

	Knowledge Area Course	3		Knowledge Area Course	3
	Pre-professional concentration	3		Pre-professional concentration	3
	Free Elective	3		Free Elective	3
	Technology Requirement	3		Free Elective	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
	Literature Major Course	3		Literature Major Course or Free Elective	6
	Literature Course/ Free Elective	3		Knowledge Area/ University Course	3
	Knowledge Area/ University Course	3		Pre-professional concentration	3
	Pre-professional concentration	3		Free Elective/ Common Experience Technology Serving Humanity Course	3
	Free Elective/ Common Experience Technology Serving Humanity Course	3			
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
	HSS Research Seminar (C2) / Literature Major Course	3		HSS Research Seminar (C2) or Literature Major Course	3
	Pre-Professional Concentration / Free Elective	3		Free Electives	12

	Knowledge Area / University Course	3			
	Free Elective	6			
Total		15	Total		15

BS In Mathematics

Joseph Skufca, Program Chair
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Mathematics is the study of numbers, functions, geometrical forms, and abstract logical structures and their associated relationships. In addition to providing an essential foundation for scientific and technical fields, mathematics is studied both for its own intellectual appeal and challenge and for its application to real-life problems. Students of mathematics also develop critical thinking and analytical skills useful for a wide variety of careers.

The mathematics program at Clarkson is rigorous and demanding, yet flexible enough to allow students to sample many disciplines or focus on a special interest. Many mathematics students also complete a minor or double major in a field such as computer science, physics, biology, or business. Students are encouraged to participate in research projects with faculty, starting as early as their freshman year. Graduates work in industry, business, or government agencies as mathematicians, statisticians, and actuaries. Many continue their education in graduate programs in mathematics or related fields; some become mathematics teachers or professors.

The mathematics curriculum is designed so that students learn to:

1. Research clearly, logically, and analytically
2. Demonstrate a solid understanding of the core material and a deeper understanding of at least one area of mathematics
3. Work effectively with standard mathematical software packages and write mathematical programs using a high level computer language
4. Apply mathematical knowledge to solve real-world, open ended problems
5. Read mathematical texts and literature and write mathematical proofs
6. Communicate effectively, both orally and in writing
7. Work effectively both individually and in teams

The mathematics major has two options. The mathematics option (detailed below) is designed for students with a general interest in mathematics and is excellent preparation for graduate school. The statistics option replaces some mathematics courses in the junior and senior years with statistics courses, and is designed to prepare students for careers as statisticians or actuaries.

In addition to the major in Mathematics, the Mathematics Department offers separate majors in:

1. Applied Mathematics and Statistics, which provides a broader range of courses applicable to many business, engineering, and industrial math applications.
2. Data Science, which combines courses from mathematics, statistics, and computational science to help students develop the interdisciplinary, data-driven

skillset needed to tackle real-world problems involving reasoning from vast volumes of data.

A student may not major in both Mathematics and either Applied Mathematics and Statistics or Data Science.

Required Courses
Mathematics and Statistics* (44 credits)
Computer Science (CS 141) (4 credits)
Physics (PH 131, and PH 132) (8 credits)
Science (BY, CM, or PH) (3 credits)
First-Year Seminar (FY 100) (1 credit)
The Clarkson Seminar (UNIV 190) (3 credits)
Knowledge Area/ University Courses (15 credits)
Free Electives** (42 credits)

**Required courses are: MA131, MA132, MA200, MA211, MA231, MA232, MA321, MA339, MA499, and STAT383, plus either MA451 or MA453. A student must also complete either the Math Option, which requires two of MA_311, MA_313, MA_314, and MA_322, or the Statistics Option, which requires STAT_381, STAT_382, STAT_384, and STAT_488*
*** Up to 12 credit hours of advanced (300- or 400-level) coursework in Aerospace Studies or Military Science may count toward graduation requirements. Aerospace Studies or Military Science credits at the 100 and 200 levels do not count toward the required 120 hours. Other restrictions may apply; check with the department for details.*

The following is the curriculum for the Mathematics major with the Math Option; with the Statistics Option some courses in the last four semesters will be different than shown here.

Mathematics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
MA 131	Calculus I	3	MA 132	Calculus	3
PH 131	Physics I	4	PH 132	Physics II	4
CS 141	Computer Science I	4	MA 200	Math Modelling & Software	3
UNIV 190	The Clarkson Seminar	3		Knowledge Area Course	3
FY 100	First-Year Seminar	1		Free Elective	3
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
MA 211	Discrete Math and Proof	3	MA 231	Calculus III	3
MA 232	Differential Equations	3	MA 339	Applied Linear Algebra	3
	Science Elective	3	STAT 383	Probability and Statistics	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Free Elective	3		Free Elective	3
Total		15	Total		15

Fifth Semester		Credits	Sixth Semester		Credits
MA 311/ MA 313	Abstract Algebra/ Abstract Linear Algebra	3	MA 322/ MA 314	Advanced Calculus II/ Number Theory	3
MA 321	Advanced Calculus I	3	MA 451/ MA 453	Intro To Math Research/ Intro to Math Instruction	2
	Knowledge Area/ University Course	3		MA/ STAT Elective	3
	Free Elective	3		Knowledge Area/ University Course	3
	Free Elective	3		Free Elective	3
Total		15	Total		14
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
MA 499	Professional Experience	0		MA/ STAT Elective	3
	MA/ STAT Elective	3		Free Electives	12
	Free Electives	12			
Total		15	Total		15

BS In Physics

TBD, Program Chair

Physics, the most fundamental of the sciences, deals with the behavior and interaction of matter, energy, space and time. It is in Physics where the basic concepts, laws and measuring techniques have been developed in the broad areas of mechanics, heat and thermodynamics; wave motion, acoustics, optics, electricity and magnetism; and the structure of matter. The concepts and techniques of Physics are the foundations of the other Sciences and of Engineering. Clarkson's Physics curriculum has been designed to meet the following goals:

1. Present the fundamental knowledge needed for professional work in industry or graduate school, while including many free electives
2. Offer a flexible curriculum to satisfy diverse career objectives and make it possible to double major in Physics and other fields
3. Provide plenty of opportunity to get involved in active research as an undergraduate

A double major with physics at Clarkson can be completed within four years. In addition to providing a flexible double major program, the Physics curriculum strongly emphasizes undergraduate research. Student research frequently leads to publication in internationally recognized scientific journals. The typical length of the Physics BS is eight semesters (four years).

The physics major requires a total of 35 credits of physics courses and must meet the University requirements for graduation with a Bachelor's degree.

Requirements for BS in Physics

Required Courses
First-Year Seminar (1 credit)
The Clarkson Seminar (3 credits)
Physics* (35 credits)
Mathematics** (18 credits)
Chemistry (8 credits)
Biology Elective (3 credits)
Knowledge Area and University Course Electives (15 credits)
Programming intensive course (3 credits)***

Required Courses
First-Year Seminar (1 credit)
The Clarkson Seminar (3 credits)
Physics* (35 credits)
Mathematics** (18 credits)
Chemistry (8 credits)
Biology Elective (3 credits)
Technology Elective (3 credits)
Free Electives**** (31 credits)

**For students considering attending graduate school in physics a total of 45 credits in physics is recommended including PH 435, two additional 300 level PH elective courses and one additional 400 level elective course.*
The 35 credits of physics courses, include:
1. Core Courses: PH 121, PH 131, PH 132, PH 221, PH 231, PH 232, PH 325, PH 327, PH 331, and PH 380. Students adding the physics major after their first semester may replace PH 121 (First Year Seminar) with PH 435 (Senior Seminar). 100/200 level PH elective courses (i.e. courses outside PH 121, PH 131, PH 132, PH 221, PH 231, and PH 232) do not count towards the major in physics.
2. One 3-credit 300 level PH elective course. Teaching methods in physics, directed study, directed research and senior thesis courses do not count towards this requirement.
3. One 3-credit 400 level PH elective course. Teaching methods in physics, directed study, directed research and senior thesis courses do not count towards this requirement.
4. One credit from any of the following professional experience courses PH 445 (Senior Thesis), PH 478 (Directed Research Experimental), PH 479 (Directed Research Theoretical) or PH 480 (Internship/Co-Op). PH 463 (Computer Simulation Methods in Physics, 3 credits, 2 communication points) also counts towards meeting the Professional Experience requirement in Physics.
*** 18 credits of Mathematics include MA 131, MA 132, MA 231, and MA 232 plus any two 300 level or higher math courses.*
****A minimum of two credits from a programming intensive course (CS 141 recommended, but also ES 100, MA 200, PH 320, PH 463. Honors students may count HP 102 or HP 103 towards this requirement). Where a PH course is used to satisfy the requirement it does not count towards the 35 credits of physics required for the physics major.*

*****Free electives should include C1/C2 courses to meet the minimum 6 Communication points requirement. PH 435 is included in Free Electives.*

Some non-credit courses in Physical Education, Aerospace Studies, and/or Military Science might be required for graduation.

Physics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
PH 131	Physics I	4	PH 132	Physics II	4
MA 131	Calculus I	3	MA132	Calculus II	3
CM 131	Chemistry I	4	CM 132	Chemistry II	4
PH 121	Physics Freshman Seminar	1		Free Elective (recommended PH157)	3
UNIV190	The Clarkson Seminar	3			
FY 100	First-Year Seminar	1			
Total		16	Total		14
Third Semester		**Credits**	**Fourth Semester**		**Credits**
PH 231	Modern Physics	3	PH 221	Theoretical Mechanics	3
PH 232	Modern Physics Lab	1	MA231	Calculus III	3
MA 232	Differential Equations	3		Free Elective (C1)	3
	Biology Elective (Recommended BY 110)	3		KA Elective	3
	KA Elective	3		Free Elective	3

	Programming Elective	3			
Total		16	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
PH 325	Thermal Physics	3		Free Elective	3
PH 380	Electromagnetic Theory	3	PH 331	Quantum Physics I	3
MA 381	Probability	3	MA 331	Fourier Series and Boundary Value Problems	3
	Free Elective	3	PH327	Experimental Phys I	3
	KA Elective	3		Free Elective (C2)	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
PH435	Senior Seminar	1		400 Level PH Elective	3
	300 Level PH Elective	3		Technology Elective	3
	Univ Elective	3		Free Elective (3 courses)	9
	Free or Bio Elective	3			
	Free Elective	1			
	PH Elective/Prof Exp.	3			
Total		14	Total		15

BS In Political Science

Jerry W. Gravander, Interim Program Chair
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Political Science investigates the institutions, practices, traditions, concepts and rules by which human beings organize their lives in common and govern themselves. Courses in Political Science enable students to use empirical analyses and theoretical constructs to understand political aspects of their world, both in the United States and around the globe. Students majoring in Political Science will acquire:

1. A comprehensive understanding of politics, political institutions, and the processes involved in translating values and information into public policy and legislation
2. A critical grasp of the leading theories and controversies animating the various subfields of Political Science
3. An appreciation of the facets of citizenship needed to participate fully in political life

Through their Political Science major at Clarkson, students will also gain the ability to:

1. Write clearly and persuasively
2. Speak effectively in a group setting
3. Think critically
4. Understand and analyze complex problems
5. Examine and interpret evidence
6. Organize and synthesize large amounts of information

Requirements for BS in Political Science

A total of 120 credit hours, including:

1. One credit introduction to the Liberal Arts pre-seminar
2. Nine courses in political science ideally including one each in:
    3. American Politics
    4. Political Theory
    5. International and Comparative Politics
    6. Law and Public Policy
7. The Humanities/ Social Sciences Research Seminar
8. 5 courses external to the major concentration
9. Fulfillment of the requirements of the Clarkson Common Experience

Political Science majors will take a series of courses chosen in consultation with their advisors to develop a coherent program of study. Students have the opportunity to develop areas of expertise in American Politics, Public Policy, Political Theory, Environmental Policy, or International Politics.

Students majoring in Political Science are required to take at least five courses in an external field. The external field is a coherent group of five related courses outside the

student's major field -- in effect, a minor. The external field can be taken in any department, including HUSS. Courses taken to fulfill requirements for a Humanities/Social Sciences Major cannot be used to fulfill requirements for a Humanities and Social
Sciences Minor.

Political Science Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
HSS120	Intro to Liberal Arts	1	STAT282	Statistics	3
UNIV190	The Clarkson Seminar	3		PSCI Major Course	3
FY 100	First-Year Seminar	1		Science Requirement	3
	Math Requirement	4		Knowledge Area Course	3
	PSCI Major Course	3		Pre-professional Concentration / Free Elective	3
	Free Elective	3			
Total		15	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
	PSCI Major Course	3		PSCI Major Course	3
	Knowledge Area Course	3		Knowledge Area Course	3
	Pre-professional Concentration	3		Pre-professional Concentration	3
	Free Elective	3		Free Elective	3
	Science Requirements	4		Free Elective	3
Total		16	Total		15

Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
	PSCI Major Course	3		PSCI Major Course/ Free Electives	6
	PSCI Major Course/ Free Elective	3		Knowledge Area/ University Course	3
	Knowledge Area/ University Course	3		Pre-professional Concentration	3
	Pre-professional Concentration	3		Free Elective / Technology Serving Humanity Course	3
	Free Elective/ Technology Serving Humanity Course	3			
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
HSS 480	Major Research Seminar	3		HSS Research Seminar/ Major Course	3
	Pre-professional Concentration/ Free Elective	3		Free Electives	12
	Knowledge Area / University Course	3			
	Free Electives	6			
Total		15	Total		15

BS In Psychology

Andreas Wilke, Program Chair
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Psychology is the study of mind and behavior. Its explorations span an enormous breadth, ranging from the activity of individual brain cells to the complex interactions between individuals and society. Psychology investigates how people develop and learn; how we perceive the world; how relationships are formed; how stress affects our health and impairs our performance; and why conflict is so much a part of the human experience. Psychologists also try to understand the nature and causes of abnormality and search for effective treatments to relieve the suffering it causes.

The Psychology program at Clarkson aims to provide each student with a solid foundation in the fundamental areas of psychology, as well as the opportunities to develop the problem solving, critical thinking, and communication skills that are critical in the workplace. We also strive to help students find interesting and rewarding careers related to psychology. To this end, each Psychology major is given lots hands-on learning opportunities. These include directed research opportunities, where the student works closely with a faculty member on an experiment of mutual interest; clinical internships, where the student works with a therapist in a clinical environment; and industrial/organizational psychology internships where the student works with psychologists in business settings. Students graduating with a BS degree in psychology from Clarkson will:

1. Be able to critically evaluate information and apply it to a problem or question
2. Be able to apply psychological principles to real-world problems
3. Have content expertise in the areas of psychology represented by the psychology faculty
4. Be able to write clearly and effectively

In addition to satisfying the Clarkson Common Experience, the BS in Psychology degree program requires:

Required Mathematics Courses:	
Three (3) college level math courses to include at least one calculus course and one statistics course.	
Required Psychology Courses:	
PY 151	Introduction to Psychology
PY 253	Social Psychology
PY 255	Cognitive Psychology

PY 456	Experimental Psychology
PY 457	Experimental Psychology Lab
PY 496	Directed Research
PY400-403	Internship (one course from this group)
Choose one of the following physiological requirements:	
PY 454	Biological Psychology
PY 458	Cognitive Neuroscience
PY 460	Neurobiology
Choose one of the following cognitive requirements:	
PY 357	Human Cognitive Evolution
PY 358	Animal Learning and Cognition
PY 359	Perception
PY 360	Learning and Memory
PY 461	Judgment and Decision Making
Choose three of the following Psychology courses:*	
PY 246	Educational Psychology
PY 286	Organizational Behavior I
PY 310	Human Sexuality
PY 311	Cyberpsychology
PY 315	Personal Relationships
PY 317	Psychology of Psychoactive Drugs
PY 319	Current Readings in Animal Behavior
PY 321	Consumer Behavior
PY 335	Personality
PH 340	Behavioral Ecology and Sociobiology

PY 361	Motivation and Emotion
PY 363	Judgment and Decision Making for the Biomedical Sciences
PY 370	Developmental Psychology
PY 411	Counseling Psychology
PY 412	Psychiatric Center Professional Experience
PY 360	Learning and Memory
PY 453	Advanced Topics in Social Psychology
PY 459	Neuroscience Society
PY 462	Abnormal Psychology
PY 463	Health Psychology
PY 480	Directed Study in Psychology.
PY 481	Directed Study in Social Psychology
PY 482	Directed Study in Physiological Psychology
PY 483	Directed Study in Cognitive Psychology
PY 491	Directed Research in Health Psychology
PY 492	Directed Research and Psychophysiology
PY 493	Directed Research in Cognitive Psychology
PY 494	Directed Research in Social Psychology
PY 495	Directed Research in Clinical Psychology
PY 498-499	Senior Thesis

**This list of courses was current when the Catalog was published. Contact the Department of Psychology for updated information.*

The Professional and Professional Experience and Information Technology requirements are distributed throughout the Psychology Curriculum. PY 456 satisfies the Technology Serving Humanity requirement.

Psychology Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
PY 151	Intro to Psychology	3	PY 253	Social Psychology	3
FY 100	First-Year Seminar	1	PY 255	Cognitive Psychology	3
UNIV 190	The Clarkson Seminar	3		Mathematics Course	3
	Mathematics Course	3		Science Course	3
	Science Course	5		Science Course Lab	2
Total		15	Total		14
Third Semester		**Credits**	**Fourth Semester**		**Credits**
	Cognitive Elective	3	STAT 318	Biostatistics	3
	Psychology Electives	6		Psychology Electives	3
	KA/UC Electives	3		KA/UC Elective	3
	Free Electives	3		Free Electives	6
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
PY 456	Experimental Psychology and Lab	5		Physiological Elective	3
	KA/UC Elective	3		Technology Elective	3
	Free Electives	9		KA/UC Elective	3
				Free Electives	6
Total		17	Total		15

Seventh Semester		Credits	Eighth Semester		Credits
	Directed Research/ Internship	3		Free Electives	15
	KA/UC Elective	3			
	Free Electives	9			
Total		15	Total		15

Professional Concentration in Health Psychology

The Professional Concentration in Health Psychology is aimed at Psychology majors interested in careers in health science. The Professional Concentration in Health Psychology can be obtained by completing any 6 of the courses listed below (18-21 credits). Note that 3 of these courses must be used as undesignated free elective courses and cannot be used for the Psychology major.

Choose three from the following courses:	
PY 253	Social Psychology
PY 310	Human Sexuality
PY 317	The Psychology of Psychoactive Drugs
PY 360	Learning and Memory
PY 361	Motivation and Emotion
PY 412	Psychiatric Center Professional Experience
PY 454	Biological Psychology
PY 458	Cognitive Neuroscience
PY 462	Abnormal Psychology
PY 463	Health Psychology

BS In Software Engineering

Details of the BS in Software Engineering degree may be found in the Interdisciplinary Program pages of this catalog.

Minors in Arts and Sciences

Minor in Biology

A minor in Biology is available to students who take at least 19 credit hours in Biology. Core Courses (9 credits): Students must take BY140 Biology I (3 cr.) and BY160 Biology II (3 cr.) and at least one of the following:

Choose one of the following:	
BY 214	Genetics
BY 222	Ecology
BY 320	Microbiology
BY 360	Comparative Physiology
BY 471	Human Anatomy and Physiology I
BY 472	Human Anatomy and Physiology II
Students must also take at least 9 credits of Biology courses numbered 300 or above.	
Students must choose one of the following laboratory courses:	
BY 142	Biology II Laboratory
BY 162	Biology II Laboratory
BY 224	Ecology Laboratory
BY 322	Microbiology Laboratory
BY 362	Comparative Physiology Laboratory
BY 473	Human Anatomy and Physiology I Laboratory
BY 474	Human Anatomy and Physiology II Laboratory

*Students should consult with the Biology Chair to determine whether AP Biology will satisfy the BY 140 and BY 160 requirements.

Minor in Biology, Behavior, and Society (BiBS)

A diverse group of disciplines attempt to document and explain the origins and functions of human cognition, social behavior, and social organization: anthropology, biology, economics, history, psychology, and sociology each include a disciplinary focus on the origins and current consequences of individual and group behavior and social outcomes. However, among disciplines - and even within disciplines - there is disagreement about the relative importance of genes, natural environment, individual rational-choice, and sociocultural-construction on individual and group behavior, cultures, and social institutions. Historical views have ranged from strong biopsychological determinism, to environmental determinism & individual rational choice, to strong sociocultural determinism. Views on the origins and current functions of behavior, culture, and society can and often do affect social policy; extreme views have provided the intellectual rationale for eugenics, racism, sexism, imperialism, laissez-faire capitalism, and collectivization and 'cultural revolution'. On a positive note, interdisciplinary progress at understanding the origins and functions of human behavior and human cultures & societies has contributed to progressive reforms in the areas of mental health, public health, laws and criminal justice, education, intercultural understanding, and programs to provide economic and social opportunity for the underprivileged. Views on questions of 'human nature' have tended to become polarized between the 'biological' (biology, evolutionary psychology, biological anthropology) and the 'social science' (social psychology, cultural anthropology, history, sociology) poles. This dialectical relationship between the social and biological sciences and the corresponding dialogue between both, forces both sides in this rich debate to refine their positions and expose students to a deeper understanding of the foundations of the respective disciplines and their impact on the world. Our minor in Biology, Behavior, and Society (BiBS) will expose students to these diverse disciplinary traditions and their conflicts and debates in the present and past. This minor provides students the knowledge and skills to become informed, critical, and reflective citizens that can make balanced decisions about the imbricate relationship of biology, psychology, culture and society.

The BiBS minor is intended for students who want to acquire an interdisciplinary and comprehensive overview of the different perspectives on human behavior, human cultural evolution, and human social organization. The objective of this minor is for students to understand the theoretical and empirical foundations of multiple disciplines that contribute to understanding human behavior and be able to knowledgeably weigh the perspectives of each. An aspirational outcome is that students can develop a synthetic, informed understanding of the origins and function of human behavior, cultures, and societies. We believe that this minor will attract students who are interested in biology, psychology, social sciences, health careers, law, politics, and economics and provide them with bio-cultural literacy critical to evaluating the multiplicity of scientific claims about 'human nature'.

The four core course requirements within this degree program provide the interdisciplinary foundation of psychology, biology, and social science. The three additional electives will provide a student with depth in specific areas while continuing to confront an interdisciplinary set of perspectives.

A minor in Biology, Behavior, and Society is available to students in all degree programs. To obtain a minor, students must complete 20 credits of required courses, and electives from outside the students declared major.

Five required courses:	
BY/ PY 340	Behavioral Ecology and Sociobiology
BY/ PY 357	Human Cognitive Evolution
HIST 270	Introduction to Culture, Society &Biology
SAS 300	Arts and Sciences Seminar
SAS 499*	Biology, Behavior and Society Minor Portfolio
Choose one course from each of the two categories:	
Category I	
ANTH 220	Understanding the Americas
ANTH 225	Global Perspectives on Sexuality
ANTH 230	Introduction to Race and Ethnicity
ANTH 270	Environment, Technology and Society
ANTH 325	Sex and Commerce
ANTH 330	Men and Masculinities
HIST 320	Medicine and Society in America
HIST 326	Modern Sex
HIST 327	History of Women and Gender in America
HIST 328	History of Gender and Sex
HIST 329	History of the American Family
HIST 342	War and Gender

HIST 350	History of Nazi Germany
HIST 351	History of the Holocaust
SOC 330	Health, Wealth, Inequality and the Environment
POL/ SOC 350	International Development and Social Change
SOC 385	Food and Society
SS 220	Introduction to Gender
Category II	
BY/ PY 319	Current Readings in Animal Behavior
BY/ PY 358	Animal Learning and Cognition
BY 420	Evolution
BY 460	Neurobiology
EC 384	Game Theory and Economic Strategy
HIST/ PY 459	Neuroscience and Society
OS 286/ PY 286	Organizational Behavior I
PH 253	Social Psychology
PY 310	Human Sexuality
PY 315	Personal Relationships
PY 360	Learning and Memory
PY 453	Advanced Topics in Social Psychology
PY 461	Judgment and Decision Making
PY 463	Health Psychology

*A student, to complete the minor, will take SAS 499 as an independent study course under the mentorship of the student's minor advisor. The student will provide a portfolio based on:

1. Term papers of equivalent products from the three major required courses
2. Representative course material that shows mastery of subject matter area
3. Will use the portfolio and materials from other courses taken for the BiBS minor to prepare a 10 page self-reflective essay on what the student has learned about

the biological, psychological, and socio-cultural influences on human behavior, human cultural evolution, and human social organization

Minor in Chemistry

Students pursuing the minor in Chemistry must complete the following requirements. The minor is not open to students majoring in Chemistry or Biomolecular Science.

Required courses:	
CM 103	Structure and Bonding
CM 104	Chemical Equilibrium and Dynamics
CM 105	Chemistry Laboratory I
CM 106/ CM 131 and CM 132	Chemistry Laboratory II General Chemistry I and General Chemistry II
Choose five of the following courses, including at least one of the labs:	
CM 221	Spectroscopy
CM 223	Spectroscopy Lab
CM 241	Organic Chemistry I
CM 242	Organic Chemistry II
CM 244	Organic Chemistry Lab
CM 300	Instrumental Lab
CM 312	Survey of Inorganic Chemistry
CM 320	Separations and Electrochemistry
CM 345	Advanced Lab
CM 371	Physical Chemistry I
CM 372	Physical Chemistry II
CM 460	Biochemistry I
CM 461	Biochemistry II
CM 470	Biochemistry/ Biotechnology Lab

Minor in Cognitive Neuroscience

Required basic science courses:	
BY 140	Biology I: Inheritance, Evolution and Diversity
BY 142	Biology I Laboratory
BY 160	Biology II Cellular and Molecular Biology
BY 162	Biology II Laboratory
CM 131	General Chemistry I
CM 132	General Chemistry II
PH 141	Physics for Life Sciences I
PH 142	Physics for Life Sciences II
PY 151	Introduction to Psychology
Required Cognitive Neuroscience Courses	
BY/ PY 458	Cognitive Neuroscience
BY/ PY 454	Biological Psychology
BY/ PY 460	Neurobiology
Choose two Psychology Elective Courses from the following:	
BY/ PY 357	Human Cognitive Evolution
BY/ PY 358	Animal Learning and Cognition
PY 317	Psychology of Psychoactive Drugs
PY 359	Perception
PY 360	Learning and Memory
PY 462	Abnormal Psychology
PY 463	Health Psychology
Choose two Biology Elective Courses from the following:	
BY 214	Genetics

BY 310	Developmental Biology
BY 350	Comparative Anatomy
BY 360	Physiology
BY 471	Anatomy and Physiology I
BY 472	Anatomy and Physiology II
BY 480	Advanced Cell Biology

[1]CM 103/ 105 and CM 104/ 106 will also satisfy the Chemistry requirement
[2]PH 131 and PH 132 will also satisfy the Physics requirement
[3]Biology majors taking the cognitive neuroscience minor cannot use PY/ BY 454 as one of their Biology elective courses

Minor in Communication
Clarkson University offers a minor in Communication that is available to all undergraduate students with the exception of Communication majors. Courses used to fulfill the requirements of the minor include writing, speaking, graphic design, and theory. To achieve a minor in Communication, students must achieve a 2.00 grade average in six three-credit courses, distributed in the following fashion:

Students must take one course from each of the four groups below, plus any other two communication courses. The currently available courses in each group are listed below. Contact the Communication, Media & Design departmental office for further information.

Choose one Writing course from the following:	
COMM 210	Theory of Rhetoric for Business, Science and Engineering
COMM 219	Introduction to Social Media
COMM 226	Short Film Screenwriting
COMM 245	Writing for Media
COMM 312*	Public Relations
COMM 313*	Professional Communication
COMM 314*	Communicating, Promoting and Marketing “Place”
COMM 315*	STEAM Journalism

COMM 326	Feature Film Screenwriting
COMM 330	Science Journalism
COMM 428*	Environmental Communication
Choose one Speaking course from the following:	
COMM 217	Introduction to Public Speaking
COMM 312*	Public Relations
COMM 313*	Professional Communication
Choose one Design course from the following:	
COMM 100	2D Digital Design
COMM 229	Principles of User-Experience Design
COMM 322	Typography and Design
COMM 327	Digital Video Production
COMM 329	Front-End Development for the Web
COMM 345	Information Design
COMM 360	Sound Design
COMM 427	Digital Video Production
Choose one Theory course from the following:	
COMM 310	Mass Media and Society
COMM 314*	Communicating, Promoting and Marketing “Place”
COMM 315*	STEAM Journalism
COMM 410	Theory and Philosophy of Communication
COMM 412	Organizational Communications and Public Relations Theory
COMM 428*	Environmental Communication

**Courses may be used for one of two groups but not both*

Note: Students may transfer no more than six off-campus credits towards the minor. The chair of the Communication, Media and Design Department must approve transfer courses.

Minor in Computational Science

The minor in Computational Science is available to students in any major. The minor allows students to develop an expertise in Computational Science while pursuing a conventional major, which provides the context wherein they apply their computational skills. To complete the minor the student must achieve a grade-point average of at least 2.00 in courses totaling at least 21 credits, distributed as follows:

Required course:	
MA 377	Numerical Methods
Choose two of the following courses	
MA 232	Elementary Differential Equations
MA 239/ MA 339	Elementary Linear Algebra/ Applied Linear Algebra
STAT 282/ STAT 383	General Statistics/ Probability and Statistics
Application area electives to make a total of 21 credits*	

**Application area electives are computational courses in departments other than Mathematics, typically drawn from the student's major. The current list of approved courses is maintained by the Mathematics Department.*

Minor in Computer Science

A minor in Computer Science is available to all students except those majoring in Computer Science or Software Engineering.

Required courses:	
CS 141	Introduction to Computer Science I
CS 142	Introduction to Computer Science II
CS 344	Algorithms and Data Structures
MA 211	Discrete Mathematics and Proof
Electives:	

Three additional CS courses, one numbered 200 or higher, one numbered 300 or higher, and one numbered 400 or higher. Each course must be worth at least three credits*

**Certain courses cannot be used for the minor and some substitutions are acceptable. Contact the Department of Computer Science for details.*

Exclusion: The Minor in Computer Science is not open to students majoring in Computer Science or Software Engineering

Minor in Digital Art

In addition to the minor portfolio requirement DA 499, all students choosing a minor in Digital Art must complete 15 credit hours within the listed class selection and satisfy the following requirements:

Completion of DA 100: Introduction to Digital Art: Time and Image or its cross-listed counterpart COMM 100: 2D Digital Design.

• Two classes from the following list at 100-level or higher.
• One class from the following list at 200-level or higher.
• One class from the following list at 300-level or higher.

DA 110	Drawing
DA 120	Elements of Design
DA 140	Introduction to Digital Art: Form & Code
DA 207	Media Landscapes 1
DA 208	Media Landscapes 2
DA 212	Art in Context
DA 225	Digital Painting & Illustration
DA 250	Interactive & Algorithmic Art
DA 300	3D Imagery & Animation
DA 320	Moving Images: Motion Graphics & Animation
DA 340	Virtual Reality (VR) and Mixed Reality
DA 39*	Special Topics Classes in Digital Arts & Sciences
DA 400	Directed & Collaborative Study
DA 410	Directed & Collaborative Study

DA 42*	Digital Arts Independent Studies
DA 500	Directed Study & Collaborative Projects

(As the capstone class in the Digital Arts & Sciences major, DA 492 Senior Studies is not open to students taking the Digital Art minor.)

Minor Portfolio Requirement
Under the guidance of Digital Arts faculty advisers from within the Department of Communication, Media & Design, students will compile a portfolio that functions as a way of showcasing and reflecting upon their achievements within the minor. The portfolio will be completed within a zero-credit hour course (DA499 Digital Art Minor Portfolio.) Students must receive a P (pass) in the minor portfolio in order to complete the requirements for the minor.

Minor in Gender and Sexuality Studies
All students choosing a minor in Gender and Sexuality Studies must complete 15 credit hours and satisfy the following requirements:

Required courses:	
Either SS 220 or SS 221	Introduction to Gender Introduction to Sexuality
SS 499	Zero-credit Minor Portfolio, as required of the other minors in the department of Humanities and Social Sciences
Choose four of the following Gender and Sexuality courses:	
SS 220 or SS 221	Introduction to Gender Introduction to Sexuality (Whichever one was not taken to satisfy the required course)
ANTH 225	Global Perspectives on Sexuality
ANTH 325	Sex and Commerce
ANTH 330	Men and Masculinities
HIST 326	Modern Sex: Sexualities and Genders in Modern America
HIST 327	History of Women and Gender in America

HIST 328	History of Gender and Sexuality in the Transatlantic World
HIST 329	History of the American Family
HIST 338	Women, Gender, and Science in American History
HIST 342	War and Gender: The Modern Period
LIT 240	Gender and Popular Culture
POL 355	Women and Politics
SOC 310	Women and Religion
SOC 330	Health, Wealth, Inequality and the Environment

Advising for the minor takes place in the Department of Humanities and Social Sciences

Minor in Law Studies

Please see the Law Studies Minor content located in the David D. Reh School Business section of the Catalog for more information.

Minor in Information Technology

A minor in information technology is available to students in any degree program. The requirements are 21 credits consisting of:

1. Two courses in problem solving and programming: CS 141 or EE 261, and CS 142 or EE 361
2. One course in computer systems: CS 241 or EE 360
3. One course in database administration IS 314*
4. One course in computer networks EE 407 or CS 455
5. Two courses concerned with Web Technologies and administration COMM 442 and COMM 444

*For School of Business Majors for whom IS 314 is not a required course, IS 211 may be used to fulfill this requirement.

Minor in Mathematics

The Minor in Mathematics is open to all students except those majoring in Mathematics, Applied Mathematics and Statistics, Data Science, or Mathematical Economics. To complete the minor the student must achieve at least a grade-point average of at least 2.00 in seven three-credit courses from the following list:

Choose seven from the following courses:	
MA 131	Calculus I
MA 132	Calculus II
MA 200	Introduction to Mathematical Modeling and Software
MA 211	Discrete Mathematics and Proof
MA 230	3-D Space and Projective Geometry
MA 231	Calculus III
MA 232	Elementary Differential Equations
MA 239	Elementary Linear Algebra
MA 277	Elementary Numerical Methods
	Any Clarkson University 3 credit MA or STAT course at the 300-level of above

Any CS course which is double-listed as an MA course at the 300-level or above also counts toward the minor; check with the Mathematics Department for details.

Minor in Medicine and Healthcare

A minor in Medicine and Healthcare is available to students in all degree programs. To obtain a minor, students must complete 23 credits:

Required courses:	
BY 471	Anatomy and Physiology
PY 463	Health Psychology
PHIL 241/ BIE 400	Medical Ethics Responsible Conduct of Research
HIST 335/ HIST 321	History of Medicine in Europe and North America History of Public Health in America
HS 220	Medicine and Healthcare Profession Seminar
HS 405	Experiential Learning in Healthcare
Choose one the following Biomedical Science and Engineering Elective courses:	
BY 315	Bioinformatics for Disease Research
BY 324	Parasitology
BY 383	Molecular Genetics and Human Disease
BY 416/ EHS 415	Principals of Toxicology and Epidemiology
BY 419	Immunology
BY 363	Pharmacology of Infectious Disease
BY 440	Introduction to Biomedical Rehabilitation Engineering and Science
BY 448	Medical Microbiology
BY 452	Pharmacology
BY 455	Cell and Molecular Biology of Cancer
BY 472	Anatomy and Physiology II
BY 473	Anatomy and Physiology I Lab

BY 474	Anatomy and Physiology II Lab
BY 476	Current Topics in Biology and Medicine
BY 485	Neural Engineering
BY 488	Stem Cells and Regenerative Medicine
BR 200	Intro to Biomedical and Rehabilitation Engineering
CM 444	Medicinal Chemistry
CM 453	Introduction to Biomaterials
CM 460	Biochemistry I
PY 462	Abnormal Psychology
Choose one of the following Healthcare and Social Sciences Elective courses:	
HS 200	Health Coaches I
PY 310	Human Sexuality
PY 317	Psychology of Psychoactive Drugs
PY 363	Judgment and Decision Making for the Biomedical Sciences
PY 411	Counselling Psychology; Theory and Practice
POL 431	Health Care Policy
SOC 330	Health, Wealth, Inequality and the Environment
Choose one of the following Healthcare and the Humanities courses:	
ANTH 330	Men and Masculinities
HIST 270	Introduction to Society, Culture and Biology
HIST 338	Women, Gender and Science in American History
HIST 353	Medicine and Ethics
HIST 331	Ancient Medicine and Magic
HIST 459	Neuroscience and Society

HIST 335/ HIST 321	History of Medicine in Europe and North America History of Public Health in America
POL 380/ PHIL 380	The Law and Bioethics
PHIL 241/ BIE 400	Medical Ethics/ Responsible Conduct of Research
SS 221	Introduction to Sexuality

Minor in Physics

A minor in Physics is available to students in any degree program. This option requires 24 credits of PH courses. A minimum 2.0 average must be maintained in these courses and none can be designated pass/no entry. The minor should be initiated by the beginning of the junior year to allow time to complete the necessary coursework. To obtain a minor, a student must complete the following:

Required courses:	
PH 131	Physics I
PH 132	Physics II
PH 231	Fundamentals of Modern Physics
PH 331	Quantum Physics
Choose one of the following intermediate courses:	
PH 221	Theoretical Mechanics
PH 230	Physics III
Choose one of the following one-credit courses:	
PH 121	Physics Freshman Seminar
PH 232	Modern Physics Laboratory
PH 435	Physics Seminar
PH 470	Directed Study Experimental
PH 474	Directed Study Theoretical

Any two 3-credit Physics or equivalent courses approved by the department at the 300-400 level.

Minor in Psychology
A minor in Psychology is available to students in any degree program except Psychology. To obtain a minor in Psychology a student must complete six courses: PY 151 (Introduction to Psychology) and any 5 Psychology courses (1) that are numbered 200 or above and (2) are each worth 3 or more credit hours. Only one of which can be one of the directed research or internship courses.

Minor in Software Engineering
A minor in Software Engineering is available to students in any degree program with the exception of the Software Engineering and Computer Science degree programs. To obtain a minor, a student must complete the following course requirements:

1. (CS 141, CS 142, and CS 344) or (EE 261, EE 361, and EE 363)
2. CS 242 or EE 408
3. EE 368 or CS 350
4. EE 465/ CS 453, CS 455/ EE 407, EE 468/ CS 460, or other course approved by the Software Engineering Program Committee

Minor in Statistics
The minor in Statistics is open to all students except those majoring in Mathematics, Applied Mathematics and Statistics, or Data Science.. To complete the minor the student must achieve at least a 2.000 grade-point average in courses totaling at least 21 credits, distributed as follows:

1. One calculus course (MA 181 or MA 131 equivalent)
2. One linear algebra course (MA 239 or MA 339 equivalent)
3. One introductory statistics course (STAT 282 or STAT 383 equivalent)
4. At least 12 additional credits from statistics courses or projects including at least two statistics courses or projects from departments other than Mathematics. The current list of approved courses is maintained by the Mathematics Department.

Minor in Humanities and Social Sciences
The Department of Humanities and Social Sciences offers minors that consist of a coherent set of five courses beyond the Clarkson Seminar, plus completion of a Minor Portfolio. There are three different types of Minors: Thematic Minors, Disciplinary Minors, and Student-Designed Minors.

Thematic Minors
These interdisciplinary minors consist of five related humanities and social sciences courses that address a common theme. The currently available thematic minors are:

1. International and Cross-Cultural Perspectives
2. Literature and the Arts
3. Science, Technology and Society
4. War Studies

Disciplinary Minors
These minors consist of five courses in one of the disciplinary areas in the Department of Humanities and Social Sciences, for example. Anthropology, History, Sociology, Literature, Philosophy, and Political Science. A list of disciplinary areas, as well as other information about these minors, is available from the Department of Humanities and Social Sciences.

Student Designed Minors
Students propose these minors through the office of the Department of Humanities and Social Sciences to a faculty committee for approval. The proposal lists the courses that a student will take for his or her minor and articulates the coherence among the courses. Students are encouraged to design their minor in collaboration with a faculty advisor in the Department of Humanities and Social Sciences. Guidelines for developing and submitting a proposal for a student-designed minor are available from the department office.

Minor Portfolio
Under the guidance of a faculty advisor in the Department of Humanities and Social Sciences, a student completing one of the above minors will compile a portfolio that represents his or her learning experience in the minor. The portfolio will be completed within the appropriately designated 499, “Humanities/ Social Sciences Minor Portfolio,” a zero-credit hour course under the direction of the student’s minor advisor in the department. A student must receive a P in the minor portfolio in order to complete the requirements for the minor. Additional information about the Minors Portfolio is available from the Department of Humanities and Social Sciences office, Snell 265.

*Courses taken to fulfill requirements for a Humanities/ Social Science Minor cannot be used to fulfill requirements for a Humanities and Social Science Major.

Other Curricular Opportunities

The Adirondack Semester

For description of this program, see the Institute for Sustainable Environment in the Interdisciplinary Section.

Clarkson Trudeau Biomedical Scholars Program

Damien Samways, Director
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The Clarkson Trudeau Biomedical Scholars Program is an intensive Spring semester-long living and learning experience (the “Trudeau Semester”) that takes place off campus at the renowned Trudeau Institute in Saranac Lake, New York.

The 15-credit program Trudeau Semester is an undergraduate program designed to provide a select group of undergraduate students the opportunities to learn multidisciplinary aspect of bioscience related to the human health field. The program is specifically designed for students from the majors of Biology, Biomolecular Science, Chemistry, and Chemical and Biomolecular Engineering, and also serves as a professional experience. The Trudeau Semester is taught by Clarkson and Trudeau Institute faculty who are respective experts in their field. The academic program provides a range of disciplines that by design will each contribute to a related topic that is the focus of a semester-long, integrative project that aims to demonstrate how technology serves humanity, a core Clarkson value. Students study and conduct a research project at the Trudeau Institute located approximately one mile from their townhouse residences in Saranac Lake. At the Trudeau Institute there is dedicated laboratory space for instruction and study offices, as a well as an office for a faculty member. Each course is 3 weeks in duration, with the exception of the Term Integrated Research Project, which the students are involved with the entire semester. Students present their research findings at the Symposium for Undergraduate Research Experiences conference that takes place each semester on the Clarkson University Campus, in addition to a public presentation.

Social Documentation: Communication and Humanities/ Social Sciences Double Major
This innovative option invites students to combine their interests in learning and using cutting-edge technology with a solid base in the social sciences (history, political science, anthropology and sociology) or the humanities (literature, film and philosophy).

Social Documentation (SD) emphasizes creativity, flexibility and versatility, allowing students to pursue a broad span of interests learning to careers in filmmaking, writing, web-based technologies, radio and TV, or governmental and non-governmental agencies. Guided by their SD advisor, students choose courses in both their majors that reflect their own interests and future plans; additionally, they take a series or core courses in common with all other SD majors to gain the research, technical and rhetorical skills they will need for career success. (For further information, see the Social Documentation section under Interdisciplinary Undergraduate Programs).

Science Studies
Many students approach their first year having found all of their secondary school science courses fascinating and wishing to explore several fields more deeply before declaring a major. These students may choose to participate in the Science Studies option which provides students with an opportunity to learn more about programs within the School of Arts & Sciences prior to selecting a final program for continued study. Students taking advantage of this option work with an advisor to develop an individualized course schedule for the first semester, designed to facilitate explorations and to keep options open. These individualized programs may involve trade-offs in later course selection, but will not extend time required to obtain a degree. With assistance from their academic advisor, undergraduates will select an approved program which best suits their individual goals and objectives. Science Studies students are fully matriculated students at Clarkson University. For more information, contact the Science Studies advisor at 315-268-6544.

THE DAVID D. REH SCHOOL OF BUSINESS

Diego Nocetti, Dean of the David D. Reh School of Business, dnocetti@clarkson.edu
Floyd Ormsbee , Associate Dean of Operations and Student Success, formsbee@clarkson.edu

The Clarkson University David D. Reh School of Business provides a valuable and interesting array of educational opportunities for students interested in careers that are aligned with the challenges and opportunities that face the business leaders of today. Managing innovation, the supply chain, customers, and flows of information and financial capital across global boundaries requires a set of knowledge and skills that become ingrained in our students. The proof is in the employment statistics of our graduates, who enjoy placement rates, starting salaries, career mobility and flexibility that are among the best in the nation.

The mission of the Clarkson University David D. Reh School of Business is to integrate high-impact, interdisciplinary scholarship with teaching excellence to develop business leaders who combine business acumen, analytical thinking, technical expertise, and a global perspective to benefit business and society.

In an effort to achieve this mission, the Reh School of Business has built a world-class faculty and created a curriculum that requires hands-on learning, provides ample opportunities to develop leadership skills, and builds professional networks inside and outside the classroom. The Reh School of Business has fostered an innovative and supportive culture where students and faculty enjoy working hard and seeing results.

We focus our resources on areas that span the traditional functional boundaries: Global Supply Chain Management, Engineering & Management, Innovation and Entrepreneurship, Financial Information and Analysis, Business Intelligence and Data Analytics and Mathematical Economics (details in Interdisciplinary Section). In doing so, our curriculum allows students to develop expertise in the traditional business disciplines – accounting, finance, marketing, management, operations, and data analytics – and then to clearly see how they fit together in the real world. This gives our graduates a balance of disciplinary expertise and an understanding of the "big picture" that is, how the functional parts of organizations must work together to create value and wealth. This combination of detail-oriented expertise with a broad, system-wide perspective is something that our employers helped us create. Our approach has proven to be effective and beneficial to employers and has helped us to earn national rankings in both Supply Chain Management, and Innovation and Entrepreneurship.

The secret to implementing these ideas is simple to explain, but difficult for most schools to imitate. We offer an innovative first-year program for undergraduates, in which students invent and then plan a real business; we offer multiple opportunities for hands-on learning; we help students build a professional network; we offer an integrated, technology-infused curriculum; and we start all of this early, at the beginning

of the Clarkson experience. The result is a connected, knowledgeable graduate prepared for success in the business world and in the community. We can do this, and do it well, because of a combination of our size, our faculty, our alumni, our location, and our heritage.

The strength of our curriculum is driven by the quality of our faculty. Faculty use active learning approaches to bring the curriculum to life. Small-group discussions, real-life case studies, projects, student consulting teams, and simulation exercises are examples of the teaching methods woven into courses. These experiences help develop students who can lead, be effective team members, and work well with customers, suppliers, colleagues, and the community. Written, oral, and technological communication skills are integrated into the entire curriculum. Frequent visits by executives and managers link the classroom to the business world. To extend and broaden learning and development beyond the classroom, all Reh School of Business students are required to have an international experience (either a traditional semester abroad, a two- to three-week faculty-led trip, a Canadian Studies course with several faculty-led weekend trips to Canadian cities, or an international summer internship) Students are also required to participate in a professional experience (such as an internship or a work co-op). Additionally, all students are encouraged to participate in campus organizations and professional societies. Clarkson University's strong programs in engineering and science provide special opportunities for students who wish to combine management with science or technical interests.

The David D. Reh School of Business's undergraduate and graduate programs are accredited by AACSB, the most prestigious national accrediting body for business programs. Fewer than 25 percent of the nation's business programs share this distinction, which is based on an institution's ability to deliver a comprehensive and unique business-related educational experience to its students.

Faculty

Consumer and Organizational Studies

Professor Augustine A. Lado; *Associate Professor Jay Carlson*; *Assistant Professors Floyd Ormsbee, Ty Mackey, Iman Paul, Rohan Crichton, Alison Mackey, Instructors Alan Belasen; Professor of Practice Marc Compeau*

Economics and Financial Studies

Professors Diego Nocetti, Bebonchu Atems; Associate Professors John DeJoy, Zhilan Feng, Allan Zebedee; Assistant Professors Anna Brown, Guoyu Lin, Zhilu Lin, Qingran Li, Michael Sacks, Wentao Wu, Amanda Geary; Instructors Gasper Sekelj, Zhujin Guo; Visiting Assistant Professor Jehu Mette

Engineering & Management

Associate Professors R. John Milne, Amir Mousavian; Assistant Professors Rosemond Ausseil, Golshan Madraki, Ajinkya Tanksale; Professor of Practice, Marshall Issen

Operations and Information Systems
Professors R. Alan Bowman, Boris Jukic, Santosh Mahapatra, Farzad Mahmoodi, Associate Professors, Dennis Yu; Assistant Professors Shafique Chaudhry, William MacKinnon, Ajinkya Tanksale, Chen Xiang, Yuan Zhang; Participating Faculty Bret Kauffman, Carl Strang, Instructor Tyler Conlon

Undergraduate Business Programs

Common First and Second-Year Curricula

The undergraduate business program's first two years are designed to provide flexibility so students are exposed to a variety of courses. Students will have formal and informal opportunities to learn about our majors, minors, and career opportunities so that they can make an appropriate choice about their academic path. With the exception of Engineering & Management, courses students take are virtually identical for all Reh School of Business students during those first two years, so a student need not declare a major until the end of their sophomore year. Freshmen who enroll as undecided business majors are considered to be fully matriculated in the School of Business. Within the first two years, students will select their specific program of interest.

We have undergraduate integrated majors that result in the Bachelor of Science degree in:

1. Global Supply Chain Management
2. Innovation and Entrepreneurship
3. Financial Information and Analysis
4. Business Intelligence and Data Analytics
5. Engineering and Management
6. Mathematical Economics (see Interdisciplinary Section)

We offer a range of minors including Corporate Innovation, Economics, Law Studies, Human Resource Management, New Product Development & Marketing, and Quality-Based Project Management.* All Bachelor of Science degree candidates must successfully complete the Clarkson Common Experience and all requirements of their major, for a total of 120 credits. Additionally, all Bachelor of Science degree candidates must complete an international educational experience and a professional experience.

*Successful completion of a minor requires completion of all prerequisites and courses designated for the minor. It is the student's responsibility to declare a minor early enough to complete all requirements.

Common First and Second Year Curriculum (non Engineering and Management majors)					
First Semester		**Credits**	**Second Semester**		**Credits**
EC 150	Principles of Microeconomics	3	EC 151	Principles of Macroeconomics	3
MA 180	Intro College Math**	3	IS 110	Intro to Business Intelligence and Data Analytics	3
SB 113	Entrepreneurship and Business Innovation*	3	MA 181	Basic Calculus	3
UNIV 190	The Clarkson Seminar	3		Science Course	3
FY 100	First-Year Seminar	1		Non-Business Elective	3
	Science Course	3			
Total		16	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
OS 286	Organizational Behavior	3	EC 311	Introduction to Econometrics	3
AC 202	Financial Accounting	3	MK 320	Principles of Marketing	3
LW 270	Law and Society I	3	AC 203	Managerial Accounting	3
	Non-Business Elective***	3	OM 331	Operations and Supply Chain Management	3
STAT 282	Statistics	3		Non-Business Elective****	3
Total		15	Total		15

**Transfer students are required to take an upper-level School of Business elective in place of SB 113.*

***Students must complete a basic calculus course (MA 181). MA 131- Calculus I can be substituted for MA 181.*

****Students considering the Business Intelligence and Data Analytics major should take IS 301*

*****Students wishing to major in Business Intelligence and Data Analytics should take IS 237 Introduction to Programming and Application Development, or CS 141 Introduction to Computer Science (4 credits), or EE 261 Introduction to Programming and Software Design in the sophomore year.*

BS In Global Supply Chain Management

The principles behind supply chain management focus on developing seamless flows of raw materials, products/services, information, and financial capital. The supply chain starts at the initial design phase and includes raw material sourcing and logistics and continues through the delivery of that product or service to the end customer with a goal of creating customer satisfaction at optimal cost. The GSCM curriculum takes a systems approach, which includes concepts and faculty from operations management, marketing, information systems, human resource management, strategic management, and economics woven together in a seamless curriculum. Concepts emphasized include:

1. Integration through ERP (Enterprise Resource Planning)
2. A process management approach to quality
3. A global orientation
4. E-commerce based strategies
5. Employing IT as a decision-making tool
6. People and organizational skills for implementing GSCM solutions
7. Incorporating environmental sustainability perspectives

Students earning a degree in Global Supply Chain Management must complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses (calculus and statistics), two science courses (one of which must include a lab), five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 27 credits of specialized business courses to satisfy the major requirements; and 18 credit hours of electives. Since 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), most electives, depending on courses chosen to fulfill the requirements of the Clarkson Common Experience, will be non-business courses taken in other schools at Clarkson University.

Required Courses:	
EC 451	Industrial and Supply Chain Economics
IS 428	Information Systems for Supply Chain Management
OM 341	Supply Chain Design and Management
OM 371	Strategic Sourcing Management
OM 451	Quality Management and Lean Enterprises
OS 466	Negotiations and Relationship Management
SB 381	Logistics Management
SB 441	Advanced Topics in Global Supply Chain Management

Professional Electives (Choose one):	
AC 305	Cost Accounting
IS 301	Applied Data Analytics
IS 314	Database Design
LW 471	Law and Society II
MK 332	Marketing Research
MK 436	Creativity, Innovation & New Product Development
OM 380	Project Management
OM 476	Management of Technology

The following would be a typical third and fourth year plan. There is enough flexibility that students studying abroad during the third year should still be able to complete the degree requirements.

Fifth Semester		Credits	Sixth Semester		Credits
FN 361	Financial Management	3	IS 428	Information Systems for Supply Chain Management	3
OS 352	Strategic Human Resource Management	3	OM 341	Supply Chain Design and Management	3
OS 466	Negotiations & Relationship Management	3		Free Elective	3
	Free or Non-Business Elective	3		Professional Elective	3
	Non-Business Elective	3		Non-Business Elective	3
Total		15	Total		15

Seventh Semester		Credits	Eighth Semester		Credits
OM 371	Strategic Sourcing	3	EC 451	Industrial and Supply Chain Economics	3
OM 451	Quality Management and Lean Enterprise	3	SB 381	Logistics Management	3

OS 432	Organizational Policy and Strategy	3	SB 441	Topics in Global Supply Chain Management	3
	Non-Business Elective	3		Non-Business Elective	3
	Non-Business Elective	3		Non-Business Elective	3
Total		15	Total		15

BS In Engineering & Management

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Clarkson's Engineering & Management (E&M) program is ideal for those who desire breadth and flexibility in a career centered on leadership and technology. The major was established in 1954 to meet the growing needs of industry for individuals with strong skill sets in both engineering and business. Graduates are prepared to integrate the rapidly changing technical and managerial aspects of an organization.

The E&M program utilizes Clarkson's traditional strengths, stressing engineering principles and technical problem solving in conjunction with quantitative and qualitative managerial decision making. Students receive a balanced education involving course requirements from each of the major disciplines of engineering, business, science and liberal arts. The carefully planned curriculum is taught by faculty within their respective areas of expertise.

The Program Educational Objectives of the E&M program are to prepare students who are within a few years of graduation to:

1. Apply technical problem solving skills to develop innovative, effective, and sustainable solutions to complex problems
2. Lead multi-disciplinary teams to success by managing team dynamics
3. Effectively communicate information for decision-making both orally and in writing to both technical and non-technical audiences
4. Continuously balance simultaneous demands of today's global environment through multi-tasking capabilities of planning, organizing, managing and controlling resources
5. Combine engineering and business core knowledge and apply quantitative and qualitative methods to process analysis in business systems
6. Make timely, ethical and useful decisions in response to organizational challenges

The Student Outcomes (SOs) are:
Students will:

SO1: Have the ability to apply calculus-based math, laboratory science, and engineering principles to technical problem-solving.

SO2: Gain the knowledge and abilities to lead multi-disciplinary teams.

SO3: Understand development and maintenance of relationships among people within and across organizations.

SO4: Build a skill set in written and oral communication through coursework, projects, and extracurricular activities.

SO5: Balance academic disciplines in science, engineering, business, and humanities to prepare for the changing workplace.

SO6: Understand financial and information flows within and across organizations.

SO7: Learn both quantitative and qualitative analysis methods.

SO8: Apply a foundation of business and management principles to making timely, ethical, and useful decisions.

SO9: Learn to lead and manage organization change.

These student outcomes address ABET Criterion 3 outcomes 1-7.

Typically, E&M students are people oriented, at ease with science and mathematics, and anticipate increasing managerial responsibilities over the course of their careers. Problem solving, communication and teamwork permeate the E&M curriculum. By design, the environment is one of collaborative teamwork and is known for strong mutual support among students. E&M graduates are recognized as leaders and facilitators who possess the ability to initiate new ideas and change.

The E&M program maintains an honor society, a professional student organization and an E&M Student Advisory Council. Alpha Pi Mu is a nationally recognized honor society that acknowledges the top 20 percent of juniors and seniors in the Engineering & Management program. The Student Association for Engineering Management (SAEM) regularly hosts business leaders and representatives who engage students in discussions that range from career opportunities to current industry trends and issues. The Student Advisory Council serves as an academic advisory group and aids in assessment of the program outcomes and student activities within the program.

Curriculum

The Engineering & Management program confers the Bachelor of Science (BS) degree upon completion of the 120 credit-hour program requirements. A candidate for the bachelor's degree must not only pass all prescribed courses in the E&M curriculum, but must also meet all other graduation requirements and Clarkson Common Experience requirements stated in the Academic Requirements section of this catalog.

The Engineering & Management student is encouraged to use program professional electives to focus on specific career objectives. Students work closely with their advisor to select electives that best suit these objectives. Students often choose to pursue a

minor in project management, a concentration in global supply chain management, or courses in construction management.

Engineering & Management Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
CM 131	Chemistry I	4	BY160 Or CM132	Cellular and Molecular Biology[5] Chemistry II	3 4
EM 120	Team-Based Design & Innovation[1,3]	3	EM121	Technological Entrepreneurship[1,3]	2
IS 110	Intro to Business Intelligence & Data Analytics[2,3]	3	EM 205	Intro to Financial & Managerial Accounting	3
MA 131	Calculus I	3	EM 313	Professional Communication[1]	3
UNIV190	The Clarkson Seminar	3	MA132	Calculus II	3
FY 100	First-Year Seminar	1			
Total		17	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
EC 350	Economic Principles & Engineering Economics[6]	3	EM 380	Project Management	3
EM 286	Organizational Behavior	3	ES 220	Statics	3
LW 270	Law & Society	3	PH 132	Physics II	4
STAT 383	Applied Statistics I[7]	3	MA232	Differential Equations	3
PH 131	Physics I	4		University Course	3
Total		16	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**

EM 333	Operations Research	3	EM 331	Operations & Supply Chain Management	3
ES 260 Or ES 222 Or EE 264	Materials Science Or Strength of Materials Or Digital Design[1]	3	EM 451	Quality Management & Lean Enterprise	3
ES 330	Fluid Mechanics	3	ES 250	Electrical Science	3
MA 231	Calculus III	3	FN 361	Financial Management	3
MK 320	Principles of Marketing	3		Professional Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
COMM 217	Public Speaking[1]	3	EM 456	Process Engineering & Design[1,3,4]	3
EM 432	Organizational Policy & Strategy[1]	3		Free Elective	3
ES 340	Thermodynamics	3		Knowledge Area	3
	Knowledge Area	3		Professional Elective	3
	Professional Elective	3			
Total		15	Total		12

[1] Communications intensive (CI) – Students must earn a minimum of six (6) CI points outside of UNIV190 to meet graduation requirements.
[2] Information technology-based courses
[3] Technology course that meets CCE requirement
[4] Students must take EM 456 or another senior capstone design course approved by the Director of E&M.
[5] Students who take BY 160 rather than CM 132 will need to complete one more credit of coursework to reach 120 credits
[6] Students who submit transfer credit for EC 150 or EC 151 prior to matriculation can complete their EC 350 requirement by taking EC 200 for one credit
[7] Students who have taken MA 330 are exempt from taking STAT 383

See Academic Requirements for details of the Clarkson Common Experience including the First-Year Seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), and related requirements. Students are required to take five courses which cover four of the six specified CCE knowledge areas; one University course (UC) must span two Knowledge Areas. All students will participate in a project-based professional experience such as co-op, internship, directed research or community project related to the student's professional goals.

BS In Innovation and Entrepreneurship

The Innovation and Entrepreneurship (I&E) major is designed to leverage existing strengths in innovation and entrepreneurship by offering students a cross-disciplinary, flexible major that provides them with the knowledge and skills to:

1. Develop and manage the innovation process
2. Plan and commercialize innovations
3. Evaluate and manage innovation opportunities
4. Participate in and manage ideation and the new product development process
5. Understand the legal and policy issues associated with new ventures
6. Stimulate and manage the creation of new business enterprises both within an existing corporate structure and as start-up enterprises

Toward this end, students are required to have fundamental knowledge of the creative process, market analysis and research, consumer behavior, commercialization, and organizational design. Students may choose to deepen their knowledge by further study in negotiations, e- business, venture finance, management of technology, and project management. Students earning a degree in Innovation and Entrepreneurship must complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses (calculus and statistics), two science courses (one of which must include a lab), five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 27 credits of specialized business courses to satisfy the major requirements; and 18 credit hours of electives. Since 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), most of the electives, depending on courses chosen for the Clarkson Common Experience, will need to be taken in other schools within Clarkson University.

Required Courses	
EC 370	Economics of Innovation
SB 322	Designing and Leading Innovation Ventures
SB 440	Innovation and Entrepreneurship Strategy
SB 437	Commercializing Innovation
MK 321	Consumer and Buyer Behavior
MK 332	Marketing Research
MK 436	Creativity, Innovation & New Product Development

Students choose 3 Professional Electives:	
AC 305	Cost Accounting
AC 407	Taxation of Business Entities
FN 455	Venture Capital and Private Equity
IS 301	Applied Data Analytics
LW 471	Law and Society II
LW 466	Law of the Workplace
MK 306	Professional Sales
OM 380	Project Management
OM 476	Management of Technology
OS 452	Advanced Human Resource Management

The following would be the typical third and fourth year plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirements.

Innovation and Entrepreneurship Curriculum					
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
EC 370	Economics of Innovation	3	MK 332	Marketing Research	3
FN 361	Financial Management I	3	OS 352	Strategic Human Resource Management	3
MK 321	Consumer and Buyer Behavior	3		Professional Elective	3
SB 322	Designing and Leading Innovative Ventures	3		Knowledge Area Course	3
	Non-Business Elective	3		Free or Non-Business Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**

MK 436	Creativity, Innovation and New Product Development	3	OS 432	Organizational Policy and Strategy	3
	Professional Elective	3	SB 440	Commercializing Innovation	3
	Knowledge Area Course	3	SB 437	Innovation and Entrepreneurship Strategy	3
	Non-Business Elective	3		Knowledge Area Course	3
	Free or Non-Business Elective	3		Free Elective	3
Total		15	Total		15

BS In Financial Information and Analysis

The field of Financial Information and Analysis (FIA) provides students with expertise in the wide range of issues common to both finance and accounting. This includes the role of accounting as the basic language of business, the importance of accounting information systems in organizational decision making, and the use of this information by financial decision makers in managing assets and investments. The knowledge and skills developed through our unique curriculum provide graduates with the ability to succeed in a workplace through integration of the traditional functions of finance and accounting.

The FIA curriculum gives each student a fundamental knowledge of managerial and cost accounting, and financial statement analysis. Career opportunities for graduates in FIA can be found in the fields of management accounting, accounting information systems design, financial management, investment management, financial services, and corporate financial planning.

Students who are interested in pursuing a career in accounting and preparing for their CPA, can select the accounting track. Students in the accounting track would take all six courses required for the FIA major (three accounting courses and three finance courses) and would fill their remaining professional electives with accounting courses. FIA majors seeking the accounting track can select three options from the following accounting courses; AC407 – Taxation of Business Entities, AC421 – Accounting Information Systems, AC431 – Advanced Accounting: Invest. & Ownership Interests, and AC436 – Auditing.

Students earning a degree in Financial Information and Analysis must complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses(calculus and statistics), two science courses (one of which must include a lab), five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 27 credits of specialized business courses to satisfy the major requirements; and 18 credit hours of electives. Since 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), most of the electives, depending on courses chosen for the Clarkson Common Experience, will need to be taken outside the School of Business.

An undergraduate student who successfully earns a degree in Financial Information and Analysis can apply to the Masters of Business Administration program at Clarkson. Successful completion of the MBA program, with an emphasis in accounting, allows a student to fulfill the 150 credit hour requirement necessary to sit for the certified public accounting licensure examination.

Required Courses	
AC 305	Cost Accounting
AC 311	Intermediate Financial Accounting I
AC 312	Intermediate Financial Accounting II
FN 462	Investments
FN 464	Financial Management II
FN 470	Strategic Financial Management
Students choose 3 Professional Electives from the following:	
AC 407	Taxation of Business Entities
AC 421	Accounting Information Systems
AC 431	Advanced Accounting Investment
AC 436	Auditing
FN/EC 468	Financial Markets and Institutions
FN 455	Venture Capital and Private Equity
FN 467	International Finance
FN 474	Models for Financial Analysis
FN 575 and/ or FN 576*	Professional Fund Management I Professional Fund Management II (must total at least 3 credits)
IS301	Applied Data Analytics
LW 471	Law and Society II

**FN 575/ FN 576 may be used for only one professional elective*

The following would be the typical third and fourth year plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirements.

Financial Information and Analysis Curriculum					
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
FN 361	Financial Management II	3	AC 311	Intermediate Financial Accounting I	3
OS 352	Strategic Human Resource Management	3	AC 305	Cost Accounting	3
	Knowledge Area Course	3	FN 462	Investments	3
	Free Elective	3		Knowledge Area Course	3
	Non-Business Elective	3		Non-Business Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
AC 312	Financial Reporting and Analysis II	3	FN 470	Strategic Financial Management	3
FN 464	Financial Management II	3	OS 432	Organizational Policy and Strategy	3
	Non-Business Elective	3		Professional Elective	3
	Professional Elective	3		Knowledge Area Course	3
	Professional Elective	3		Non-Business Elective	3
Total		15	Total		15

BS In Business Intelligence and Data Analytics

Business intelligence and data analytics involves tools and practices that drive access, analysis, and interpretation of business data. This analysis leads to improved decision making and performance across the value chain. These tools and skills are essential in today's data driven economy. The Bachelor of Science in Business Intelligence and Data Analytics (BIDA) degree will help create process-oriented information managers with the ability to develop keen data- driven insights into business problems and solutions. Graduates will be able to work effectively with a range of organizational stakeholders with varying knowledge and skill bases - from data scientists to field salespeople. Graduates will be able to identify and use proper data and analysis tools for effective problem solving and importantly, will be able to communicate information effectively across the organization to promote and support clear, balanced, and transparent decision-making. Students graduating with the BIDA major will have the following knowledge and skills:

1. An understanding of the components of information systems: Enterprise Resource Planning platforms, Business Intelligence, Database Management Systems, Data Analytics Technologies, and emerging innovations in the field
2. An understanding of, and experience with, the software application design, development, and deployment process
3. The ability to use industry-recognized business systems such as SAP ERP and analysis tools such as Microsoft Excel
4. An understanding of the business requirements underlying all data collection and analysis.
5. The ability to work closely with business practitioners across all disciplines to help provide the data and analysis that is necessary and relevant for organizational decision makers
6. A working knowledge of databases, including structure and usage in multiple business contexts across disciplines, industries, and organizations, and fundamental knowledge of tools such as SQL (Structured Query Language)
7. A working knowledge of data collection methods, including structured and unstructured data, and the process by which the data is extracted, transformed, and loaded into the various types of information systems for analysis
8. The ability to perform a variety of data analyses, such as pivot table analysis, optimization, and statistical analysis
9. The ability to communicate the results of data analysis to organizational decision makers and other stakeholders in different forms, including reports, tables, graphs, as well as real-time visualization tools and dashboards

Graduates with a BIDA degree will have a great deal of flexibility upon graduation. They may become data acquisition experts or analysts, database administrators, or pursue a graduate degree in the data science field. They may also pursue a career in the more traditional information systems field such as IT project managers or enterprise system consultants.

Students earning a degree in Business Intelligence and Data Analytics must complete 120 credits including the following: 33 credits of Clarkson Common Experience requirements (including the Clarkson Seminar, two mathematics courses (calculus and statistics; MA131 is recommended, followed by STAT282 and MA239, Elementary Linear Algebra, as a non-business elective), two science courses (one of which must include a lab), five knowledge area courses, and a technology course); 42 credits of foundation coursework in business; 21 credits of specialized courses to satisfy the major requirements; and 6 credit hours of professional electives.

Note that 50% of coursework must be taken outside the School of Business (no more than 3 economics and 2 statistics courses can count as non-business courses), so most of the electives will need to be taken outside the School of Business, depending on courses chosen for the Clarkson Common Experience.

Required Courses	
CS 141 Or EE 261 Or IS 237	Introduction to Computer Science Introduction to Programming and Software Design Introduction to Application Development
IS 301	Applied Data Analytics
IS 314	Database Design and Management
IS 400	Process and System Analysis and Modeling
IS 415	Data warehousing for Analytics
IS 426	Big Data Architecture
IS 437	Data Analytics Project: Planning, Development, and Data Analysis

Students choose 2 Professional Electives from the following:	
AC 421	Accounting Information Systems
COMM 345	Information Design
CS 460 / EE 468	Database Systems
EM 333	Elements of Operations Research (pre-requisite courses include MA 131, MA 132, and STAT 383)
IS 428	Information Systems for Supply Chain Management
OM 380	Project Management

The following would be the typical third- and fourth-year plan. There is enough flexibility so that students studying abroad during the third year should still be able to complete the degree requirements. Note that for this major, IS237 Introduction to Programming and Application Development, or CS141 Introduction to Computer Science I or EE261 should be taken prior to the junior year.

Business Intelligence and Data Analytics Curriculum					
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
FN 361	Financial Management	3	IS 415	Data Warehousing for Analytics	3
IS 314	Database Design and Management	3		Professional Elective	3
OS 352	Strategic Human Resource Management	3		Free or Non-Business Elective	3
	Non-Business Elective	3		Knowledge Area Course	3
	Knowledge Area Course	3		Free Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
IS 400	Process and Systems Analysis and Modeling	3	IS 437	Data Analysis Project	3
IS 426	Big Data Architecture	3	OS 432	Organizational Policy and Strategy	3
	Professional Elective	3		Non-Business Elective	3
	Free or Non-Business Elective	3		Non-Business Elective	3
	Non-Business Elective	3		Knowledge Area Course	3
Total		15	Total		15

Minor and Concentrations in Business

The minor in business is designed for students with a major outside of the Reh School of Business who wish to pursue a collateral area in business. Completion of the minor provides broad exposure to the foundations of major business functions. These areas include accounting, economics, finance, law, organizational behavior, operations management and marketing. All students choosing to minor in business must complete 18 credit hours, or six courses, from among the following:

AC 205	**Introduction to Accounting for Decision Analysis**
EC 150 or EC 350*	Principles of Microeconomics Economic Principles and Engineering Economics
EC 151 or EC 350*	Principles of Macroeconomics Economic Principles and Engineering Economics
FN 361	Financial Management I
LW 270	Law and Society I
MK 320	Principles of Marketing
OM 331	Operations and Supply Chain Management
OS 286	Organizational Behavior

**Students who complete EC 350 – Economic Principles and Engineering Economics are exempt from taking EC 150 and EC 151. EC 350 covers material from both EC 150 and EC 151. EC 350 will satisfy one course towards the minor. Students must then choose their remaining five classes from AC 205, LW 270, OS 286, FN 361, OM 331 or MK 320.*

Corporate Innovation Minor

Students taking this minor will learn and gain experience in Corporate Innovation. Corporate Innovation includes a variety of processes and tools that companies use to invent new products and processes, improve existing products and processes, and bring these new and improved products/processes to market.

This minor will provide students with the ability to recognize opportunities for invention and improvement. Students will develop creative thinking, analytical, and problem solving skills to invent new or improve existing methods/products/processes within the resource base and constraints of organizations. There will be opportunities to address unstructured and ill-defined problems, take informed risks, and manage those risks knowledgeably in an effort to move inventions & improvements into the marketplace. Students will develop persuasion and selling skills to convince others inside and outside medium/ large organizations to support and/ or adopt the innovation.

All students choosing to minor in Corporate Innovation must complete 15 credit hours (5 courses), maintain a 2.0 average in minor courses, and satisfy the requirements indicated.

Required Courses	
SB 236	Introduction to Customer-Focused Design
Choose one of the two:	
MK 436	Creativity, Innovation, and New Product Development
SB 437	Commercializing Innovation
Choose one course from each of the three areas:	
Problem Solving in Organizations	
EC 370	Economics of Innovation
MK 332	Marketing Research
MK 321/ PY 321	Consumer Behavior
OM 380/ EM 380	Project Management
OM 451/ EM 451	Quality Management & Lean Enterprise
OM 476/ EM 476	Management of Technology
Persuasion	
MK 306	Professional Sales
OS 466	Negotiation and Relationship Management
PY 253	Social Psychology
Experiential Innovation (analyzing and solving an unstructured problem)	
Any of the school of Engineering Senior Design Courses, including but not limited to:	
CE 492	Senior Design (Building, Architectural)
CE 493	Senior Design (Transportation Systems)
ME 445	Integrated Design I
EM 456	Capstone Design Project for E&M Seniors
SB 356	Invention Development & Protection

With approval by the Reh School of Business Dean's office, or a faculty member appointed by the Dean, a student may substitute up to one course within the three elective areas immediately above with a similar course encompassing innovation as its core objective. This course could focus on designing novel solutions to engineering, technical, or social problems or the analysis, design, and implementation of operational improvements at a company. This course can come from any department on campus.

Minor in Economics

The development of an understanding in economics is not only necessary for all managers but also for all those seeking to understand how and why economic forces affect and shape the society and the world we live in. The success of any business ultimately depends on the decisions its managers make concerning the allocation of resources under differing market and economic conditions. Successful decision making requires a good understanding of markets and the central role that economic incentives play within and outside the firm. The Clarkson economics minor is designed to give students the basic tools and analytical background in economic analysis. The minor in economics can complement almost any major, whether in arts and sciences, business or engineering. The minor in economics consists of 18 credit hours of economic courses as follows:

EC 150 or EC 350*	**Principles of Microeconomics Economic Principles and Engineering Economics**
EC 151 or EC 350*	Principles of Macroeconomics Economic Principles and Engineering Economics
EC 311**	Introduction to Econometrics

*A students may not take EC 150 or EC 151 if a student has taken EC 350. Entry to EC 350 is limited to students who have declared a major in Engineering and Management or a major in the School of Engineering.

**Students who have completed STAT 383 Probability and Statistics are exempt from EC 311 but will have to complete another upper level Economics course to replace EC 311.

Three or four electives (9 credit hours) of 300- or 400-level EC designated courses if a student has taken EC150 and EC151. Four electives (12 credit hours) of 300- or 400-level EC designated courses if a student has taken EC350.

Minor in Human Resource Management

The Human Resource Management (HRM) minor is available for students in all majors who want to prepare themselves for managerial, human resources, or consulting careers. The HRM minor provides an in-depth foundation for managing people in organizations, drawing upon relevant theories of organizational behavior, research evidence on HRM practices and systems, and recent HRM innovations. Students will develop capabilities in key HR areas such as selection, training and development, performance measurement, compensation, and HR metrics, among others. The HRM minor emphasizes the strategic aspects of HRM, with a focus on enhancing organizational outcomes for multiple stakeholder groups, including shareholders and employees. All students choosing to minor in Human Resource Management must complete the following courses totaling 15 credits:

Required Courses	
OS 286/PY 286/ EM 286	Organizational Behavior
OS 352	Strategic Human Resource Management
OS 452	Advanced Human Resource Management
Any 2 of the following courses:	
EC 475	Personnel Economics
EHS 309	Intro to Environmental and Occupational Health
EHS 330	Occupational Safety and Ergonomics
LW 466	Law of the Workplace
OS 466	Negotiations and Relationship Management

Minor in Law Studies

The minor in Law Studies is designed for students with an interest in studying law. The minor is beneficial for students who wish to structure their academic program to help prepare for law school. The minor will also serve the needs of students such as those who have an interest in human resource management, political science, construction management and supply chain management who want to learn more about the field of law and its many diverse issues and perspectives. All students choosing to minor in Law Studies must complete 18 credit hours (six courses), maintain a 2.0 average in minor courses and satisfy the requirements indicated below.

Perspectives of the Law (required)	
LW 270	Law and Society I
POL 400	Constitutional Law
Law Studies Minor Portfolio (required)	
LW 499	Law Studies Minor Portfolio

The lists below include current selected minor courses. For the complete list, contact either the Associate Dean of Arts & Sciences at 315-268-6411 or the Associate Dean of Business at 315-268-2300.

Areas of Law (Take 2 of the following):	
LW 466	The Law of the Workplace
LW 471	Law and Society II
POL 375	Environmental Law
LW 352	Reading of the Law: Legal Issues in Non-Fiction Literature
POL 380	Law and Bioethics
POL 362	Human Rights Law and Politics
Policy/Social Issues (Take 1 of the following):	
COMM 310	Mass Media and Society
COMM 428	Public Debate and the Environment
LIT 335/POL 335	Violence & Reconciliation
PHIL 243	Business Ethics
POL 471	Energy Policy

SOC 330	Health, Wealth, Integrity & Environment
LW 490	Internship (Subject to availability)
Communication (Take 1 of the following):	
COMM 210	Theory of Rhetoric for Business, Science, and Engineering
COMM 217	Introduction to Public Speaking
COMM 410	Theory and Philosophy of Communication
COMM 417	Business and Professional Speaking
PHIL 330	Logic for Critical Thinking

Product Development & Marketing Minor

This minor is for students interested in exploring concepts and tools associated with the design and marketing of new products. Courses support four dimensions of product development: a) new product planning - plan and develop the entire lifecycle of a product, b) understanding the social and environmental impact of technical solutions, c) establishing functional, technical, and aesthetic components of product design, and d) generating virtual and physical prototypes.

Coursework in this minor also supports learning about marketing new products, including crafting a clear message, identifying appropriate distribution channels, customer acquisition and engagement, customer co-innovation, and using social media and analytics to manage messaging. All students choosing to minor in Product Development and Marketing must complete 21 credit hours (seven courses), maintain a 2.0 average in minor courses and satisfy the requirements indicated below.

Four required courses include:	
SB 236 OR **COMM 229 OR** **SB 322**	Introduction to Customer-Focused Design Principles of User Experience Design Designing and Leading Innovative Ventures
Plus:	
MK 320	Principles of Marketing
MK 321/ PY 321	Consumer Behavior
MK 332	Marketing Research
MK 436	Creativity, Innovation, New Product Development

Two courses from the following:	
COMM 100/ DA 100	2D Digital Design
COMM 210	Theory of Rhetoric for Business, Science, and Engineering
COMM 219	Introduction to Social Media
COMM314	Placemaking, Marketing and Promotion
COMM 345	Information Design
COMM347	Design Thinking
COMM375	Product Design
COMM448	Portraying Innovation Through the Lens
COMM449	Narrating Innovation
COMM450	Leading Innovation
SB/EM 356	Invention Development & Protection
Required: New Product Development and Marketing Portfolio	
MK 419	New Product Develop and Marketing Portfolio*

**Students must complete a 0-credit new product development and marketing portfolio (MK 419) to maintain a repository of work from the minor classes related to work during their time at Clarkson.*

The portfolio will include material from four design projects completed by the student during their Clarkson experience.

Minor in Project Management

Clarkson University offers a minor in Project Management that is available to all undergraduate students. This minor is intended for students in all majors who want to prepare themselves for potential careers in project-centered work. A unique benefit of this minor is that students can pursue certification through the Project Management Institute (PMI)™ after completing the requirements of minor. PMI's Certified Associate of Project Management (CAPM)® is considered the pathway to the Project Management Professional (PMP)® certification that is rapidly emerging as one of the fastest growing professional certifications in many industries and career areas. Additionally, certain students may opt to sit for the American Society for Quality's "Certified Quality Improvement Associate" exam since the Quality Management course covers the body of knowledge for that particular certification. Students who pursue the minor are under no obligation to sit for the CAPM® or CQIA®, which require an application and separate fee, completed and paid for by the student.

To achieve a minor in "Project Management," students must maintain a 2.0 average in the five (5) three-credit courses, distributed in the following fashion:

Two required courses:	
OM 380/EM 380	Project Management
OM 451/EM 451	Quality Management and Lean Enterprise
One of the following courses:	
OM 484/EM 484 OR	Advanced Project Management
EM 482	Systems Engineering and Management
Elective courses (choose any pair):	
OS 286/EM 286 **AND OS 352**	Organizational Behavior AND Strategic Human Resource Management
OR **OS 286/EM 286 AND OS 466**	OR Organizational Behavior AND Negotiations and Relationship Management
OR **OM 331/EM 331** **AND** **OM 476/EM 476** **OR** **EM 482*** **OR** **OM 484/EM 484***	OR Operations and Supply Chain Management AND Management of Technology OR Systems Engineering and Management OR Advanced Project Management

**Students can take whichever was not selected previously*

Concentration in Global Supply Chain Management for E&M Majors
The principles behind supply chain management focus on developing seamless flows of raw materials, products/services, information, and financial capital. The supply chain starts at the initial design process and includes raw material sourcing, logistics and continues through the delivery of that product or service to the end customer, with a goal of creating customer satisfaction at optimal cost.

A concentration in Global Supply Chain Management offered through the School of Business is available to E&M students. It requires 15 or more credit hours of specified coursework. Completion of an approved concentration is indicated on a student's transcript.

Three required courses:	
EM 341	Supply Chain Design & Management
EM 381	Logistics Management
EM 371	Strategic Sourcing
Students must choose two courses from the following:	
OS 466	**Negotiations and Relationship Management**
IS 428	Information Systems for Supply Chain Management
EM 451	Quality Management & Lean Enterprises

Co-ops, Internships, and Professional Experience
Students are required to gain professional work experience and are encouraged to participate in the University Co-op or Internship Program. Please refer to the Career Center for more details on these programs. Additionally, the Reh School of Business may approve internships independently arranged by a student as fulfilling the professional experience requirement.

Global Study Requirement
All business majors are required to complete a global studies requirement. Students interested in cultural and trade relations between the United States and other countries may participate in the University International Student Exchange Program. It is expected that qualified students will complete a study exchange for at least one semester. Please refer to the International Center for more details on this program. If a student is not eligible for the Student Exchange Program, there are other options available for the student to fulfill the global study requirement, including participation in a two or three week faculty led trip (UNIV 399 Global Business Experience or UNIV 267 Into to Canada) to a foreign country.

WALLACE H. COULTER SCHOOL OF ENGINEERING

"Technology Serving Humanity"

William Jemison, Dean, wjemison@clarkson.edu
John Moosbrugger, Associate Dean for Academic Programs, jmoosbru@clarkson.edu

In our modern technological society, engineers and scientists must work together with a variety of other professionals in seeking solutions to complex problems. Revolutionary advances in applied science and technology have broadened the horizons of engineering. At the same time, these advances have created a multitude of challenging multidisciplinary problems in virtually every sphere of human activity.

The role of engineers in today's society has become more and more critical. Engineers require not only a knowledge of fundamentals for finding solutions to problems, but they must be aware of the broad social, economic, political, and environmental implications of their ventures. The engineering programs at Clarkson are designed to provide students with a foundation in science, engineering, humanities, and management. Our goal is to make sure Clarkson graduates are highly competent in their chosen fields while at the same time they are alert on their responsibilities to society and truly practice "Technology Serving Humanity."

In preparing students to become effective contributors to society and industry, Clarkson University has developed an award-winning program called SPEED (Student Projects for Engineering Experience and Design). The current seventeen SPEED projects, including FIRST Robotics and Mini-Baja, encompass multidisciplinary and socially responsible approaches to solving real-world problems. Not only do the SPEED projects involve design and fabrication, they also incorporate marketing, public relations, communications, and management resulting in teams being made up of engineering, business, science, and liberal arts students. The Coulter School also provides opportunities for research experience for undergraduates (REU) involving participation of students in faculty research labs. These programs offer opportunities for students to amass the necessary "real-world" experiences and professional skills through several engineering design projects and research experiences.

In spring 2002, Clarkson announced that the Wallace H. Coulter Foundation had made a $30 million commitment to the University in support of ongoing excellence in its engineering and science programs. This gift reinforces and broadens Clarkson's most successful learning and research activities in support of the theme "Technology Serving Humanity."

Clarkson's School of Engineering has been named the Wallace H. Coulter School of Engineering in recognition of the Foundation's generous gift and the late Wallace Coulter's dedication to the University as a trustee. Wallace H. Coulter was a renowned inventor and entrepreneur. He became acquainted with Clarkson through his collaboration with colloid scientists on the faculty. In 1979 he received an honorary

doctorate, and he served as a trustee of the University from 1983 to 1989. Through the years he maintained close connections with Clarkson, supporting research projects and establishing an endowed scholarship.

The grant funds funded five key areas: team project-based learning activities; endowed chairs and endowed fellowships; a new program in rehabilitation biomedical engineering; upgrades of laboratory facilities; and scholarships for both minority students and women pursuing a degree in engineering. Growth in these evolving areas will complement and reinforce the programs and curricula described in this catalog.

The Coulter School of Engineering comprises the Departments of Chemical and Biomolecular, Civil and Environmental, Electrical and Computer, and Mechanical and Aeronautical Engineering. Faculty and students also participate in the interdisciplinary Engineering and Management, Software Engineering, and Undergraduate Interdisciplinary Minors. More information can be found in the Interdisciplinary Program section of the catalog.

Faculty

Chemical and Biomolecular Engineering

Elizabeth Podlaha-Murphy Chair; Professors: Sitaraman Krishnan, Selma Mededovic; Liya Regel and Bill Wilcox Distinguished Professor of Engineering Ross Taylor; *Assistant Professors:* Bethany Almeida,, Yuncheng Du, Taeyoung Kim, Simona Liguori, Ian McCrum, Jihoon Seo; *Emeritus Professors*: Ruth Baltus, Richard McClusky, John McLaughlin, Shankar Subramanian, *Distinguished Research Professor* S.V. Babu

Civil and Environmental Engineering

Steven F. Wojtkiewicz Professor and Chair of Civil and Environmental Engineering; Professors: Michelle Crimi, John P. Dempsey, Andrea R. Ferro, Allen M. Gontz, Stefan J. Grimberg, Thomas M. Holsen, Sulapha Peethamparan, Susan Powers,Shane Rogers, Weiming Wu; Associate Professor: Tyler Smith; Assistant Professors: Abul Baki, Behzad Behnia, Lissette Fernandez, Xianda Shen, Robert Thomas, Siwen Wang, Suguang Xiao, Yang Yang; Professor of Practice and Director of Construction Engineering Management Erik Backus; Distinguished Service Professor Spencer Thew; Professor of Practice: William Olsen; Adjunct Instructor: Robert Curtis ; Distinguished Research Professor Hung Tao Shen; Research Professor Kerop Janoyan; Research Assistant Professor Fengbin Huang; Emeritus Professors: Norbert L. Ackermann, Gordon B. Batson, James Edzwald, Feng-Bor Lin, Levon Minnetyan, *Hayley H. Shen, Hung Tao Shen, Poojitha Yapa, Thomas Young*

Electrical and Computer Engineering

Paul B. McGrath Professor and Chair of Electrical and Computer Engineering; Professors: David Crouse, Thomas H. Ortmeyer, Ming-Cheng Cheng, Daqing Hou,, Stephanie Schuckers, William Jemison; Associate Professors: Mahesh Krishna Banavar, *James J. Carroll, Abul N. Khondker, Chen Liu, Jack Koplowitz; Assistant Professors: Yu Liu, Chee-Keong Tan, Tuyen Vu, Faraz Hussain, Jianhua Zhang, Yazhou Jiang, Masudul Imtiaz,; Distinguished Research Professor Liya L. Regel; Director of Undergraduate Labs: Ajay Sonar*; *Adjunct Instructor: Angela Peplowski.*

Mechanical and Aerospace Engineering

Brian Helenbrook Professor and Chair of Mechanical and Aerospace Engineering; Professors: Goodarz Ahmadi, Daryush K. Aidun, Doug Bohl, Cetin Cetinkaya, Suresh Dhaniyala, Chunlei Liang, Marcias Martinez, John Moosbrugger, Kenneth Willmert; Associate Professors: *Ajit Achuthan, Byron Erath, Kevin Fite, Carl Hoover, Kathleen Issen, Laurel Kuxhaus, Ioannis Mastorakos, Arthur Michalek, Pat Piperni, Kenneth D. Visser, Philip Yuya; Assistant Professors: Michael Bazzocchi, Craig Merrett, Mohammadreza Radmanesh; Professor of Practice: Ronald Buckingham;*

Undergraduate Programs

The eight semester undergraduate degree granted in engineering is the Bachelor of Science (BS), with specialization in one of the nine programs accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org:

1. Aerospace Engineering
2. Chemical Engineering
3. Civil Engineering
4. Computer Engineering
5. Electrical Engineering
6. Engineering & Management *Program administered by the Reh School of Business
7. Mechanical Engineering
8. Software Engineering
9. Environmental Engineering

A candidate for the bachelor's degree must not only pass all prescribed courses in one of the eight semester engineering curricula, but must also meet all of the other graduation requirements and Clarkson Common Experience requirements.

Minors and Professional Concentrations

Clarkson's engineering curricula contain a number of elective courses. Furthermore, many students have room for additional courses through advanced placement, overloading, and by taking courses in the summer. Therefore, engineering students, in consultation with their advisors, have an opportunity to formulate academic programs that reflect individual interests, career goals, and areas of professional specialization. See Professional Concentrations in Engineering and Minors and Concentrations.

Engineering Studies

Some students entering the School of Engineering are not sure which academic discipline to pursue. These students may choose the Engineering Studies Program. A Director of Engineering Studies and support faculty serve as advisors to these students, and assists them in selecting curricula. For additional information, consult with the Associate Dean of Engineering for Academic Programs at 315-268-6446. The Engineering Studies classification affords students with an opportunity to matriculate toward the completion of an engineering degree program within the School of Engineering prior to selecting a specific degree program. Undergraduates may choose between; Aerospace Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering and Software Engineering.

Combined BS Engineering MBA or MS/MBA Programs

By proper selection of electives, in five years a Clarkson student can receive a BS in engineering and a master's degree in business administration. This may require course

overloads in some semesters and/or attendance at summer school. Interested students should contact the School of Business regarding the five-year BS/MBA option. Students with a B.S in engineering also have an option to earn both a master's degree in engineering and a master's degree in business administration in two years.

Pre-Law

Please see the Pre-Professional Program section of the catalog for more information.

Engineering Student Organizations and Design Competitions

In addition to the University organizations, Clarkson has student-led chapters of the following professional organizations:

1. American Indian Science and Engineering Society
2. American Institute of Aeronautics and Astronautics
3. American Institute of Chemical Engineers
4. American Society of Civil Engineers
5. American Society of Mechanical Engineers
6. Association of General Contractors
7. Associated Schools of Construction
8. Institute of Electrical and Electronic Engineers
9. National Society of Black Engineers
10. New York Water Environment Association
11. Society for Hispanic Professional Engineers
12. Society of Automotive Engineers
13. Society of Women Engineers

Each department has an honorary society, and there is an all-engineering honorary society. Students can participate in national competitions.

1. Chem E Car
2. Clean Snowmobile
3. Concrete Canoe
4. Construction Management
5. Design, Build, Fly
6. FIRST Robotics
7. Formula SAE
8. Formula SAE Electric
9. Human Powered Vehicle
10. Mini-Baja SAE
11. Steel Bridge
12. Timber Bridge

Transfer Programs

Both 2+2 and 3+2 transfer programs are available at Clarkson.

Undergraduate Engineering Programs

Common First-Year Engineering Curriculum in Engineering

For all majors the first two semesters are nearly identical in the undergraduate engineering curricula. Therefore, students may defer the selection of a major field of study until the beginning of the sophomore year. Beginning with the junior year, a significant amount of specialized material is incorporated into each curriculum. In the senior year, coursework is concentrated in the student's chosen field. Courses in humanities and social sciences are taken throughout the four-year program as part of the Clarkson Common Experience.

Common First-Year Curriculum in Engineering*					
First Semester		**Credits**	**Second Semester**		**Credits**
CM 131	Chemistry I	4	CM 132/ BY 160/ CS 141	Chemistry II Biology II** Intro to Comp Science**	4
MA 131	Calculus I	3	ES 100	Introduction to Engineering	2
PH 131	Physics I	4	ES 110	Engineering and Society or equivalent***	3
FY/PE 100	First Year Seminar	1	MA 132	Calculus II	3
UNIV 190	The Clarkson Seminar	3	PH 132	Physics II	4
Total		15	Total		16

**This is a typical curriculum sequence, listing courses that are required for all engineering majors, except Engineering and Management. Not all students will complete these courses in the first year. For example, some students will take ES 110 in lieu of PH 131 in the first semester, then PH 131 in the second semester and PH 132 in the third semester.*

***Mechanical and Aerospace Engineering majors can substitute BY 160 for CM 132. Students who do not also take BY 162 (Biology II Laboratory) should consult with their advisor to insure they will meet the 120 credit hour requirement. Chemical, Civil, and Environmental Engineering require CM 132. Chemical engineering majors may substitute CM103, 104, and 105 for CM 131 and 132. Electrical, Computer, and Software Engineering require CS 141.*

****ES 110 or equivalent is a required Knowledge Area course for engineering majors (except for University Honors Program Students). A total of five Knowledge Area courses must be taken, and these courses must cover at least four of the six knowledge areas. At least one of these courses must be a university course. University courses are interdisciplinary courses that cover two or more knowledge areas. One of the knowledge area electives must be an economics course, EC 350 is required for most degrees.*

BS In Aerospace Engineering

The Program Educational Objectives (PEOs):
The PEOs for the Aerospace Engineering program are to produce graduates who:

PEO1: competently apply engineering methods to solve professional problems associated with the design, development, manufacture, and maintenance of aerospace and related systems and understand the social, ethical, and environmental context of their work.

PEO2: communicate clearly with diverse and international communities, collaborate competently in cross-functional teams, and assume leadership roles while meeting the expectations of their employers.

PEO3: habitually engage in professional development.

The Student Outcomes (SOs):
In order to prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The Aerospace engineering program expects that graduates have a knowledge of aerodynamics, aerospace, structures, propulsion, flight mechanics, and stability and control. It is also expected that graduates have design competence that includes integration of various disciplines within aerospace engineering.

Curriculum Overview: The 120-credit program contains 87 credit hours of required technical courses, 33 credit hours of electives (including one professional elective, one Aerospace professional elective, one undesignated elective and five Knowledge Area/University Course, KA/UC, electives).

Required Technical Courses: The first two years of the curriculum cover mathematics, physics, chemistry and engineering science courses (including basic principles of statics, dynamics, solid mechanics, electrical circuits, materials and the use of computers).

In the third and fourth years, students take specialized courses on topics such as aerodynamics and flight mechanics. These courses provide knowledge and skills that strongly support the second outcome listed above, which is a key element in aircraft design. The laboratory components of the first-year physics and chemistry courses introduce study of the relationship between theory and reality. This fosters the development of the student's technical intuition. Aerospace engineering laboratory courses add to this development.

Training in professional problem-solving begins in the fall of the second year, with the first course in engineering design. The first course to train students formally in the solution process, it lays the foundation for the fourth-year capstone design course. In the capstone course, students work in teams to design an aircraft. Thus, they learn to apply the solution process to a real professional problem. Students may acquire additional professional experience by participating in the Design, Build, and Fly

Competition team. They may also participate in the Formula SAE, Mini-Baja, Clean Snowmobile, or other team competitions, which are open to any student.

Common Curriculum Requirements: Plans of study must include a total of five Knowledge Area (KA) courses. Students will select these so that at least one is a designated University Course, and so that together these five courses cover four distinct knowledge areas. Communication intensive course requirements will be fulfilled by a combination of courses having one or two communication points each, with a total of six points required for graduation. At least two of these six points will be earned through 300- or 400-level courses required in the major.

Professional and Undesignated Electives: The professional elective and aerospace professional elective must meet criteria in the Mechanical and Aerospace Engineering (MAE) Department Student Handbook. One Aerospace Studies or Military Science course (400-level) may be used as the professional elective. The undesignated elective may be any college-level course that does not contain a significant amount of material already covered in other courses. It could be chosen to enrich the student's technical or nontechnical background. Aerospace Studies or Military Science courses (200-level or above) may be used as the undesignated elective.

Aerospace Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering					
First Semester		**Credits**	**Second Semester**		**Credits**
MS/ AS	Military Science/ Aerospace Studies (if elected)	1	MS/ AS	Military Science/ Aerospace Studies (if elected)	1
Total		15	Total		16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
ES 220	Statics	3	AE 201	Intro to Experimental Methods in Mechanical & Aeronautical Engineering	1
ES250	Electrical Science	3	AE342	Intro to Comp Methods	3
ES260	Materials Science	3	ES 222	Strength of Materials	3

MA 232	Elementary Differential Equations	3	ES 223	Rigid Body Dynamics	3
AE 212	Intro to Engineering Design	3	MA 231	Calculus III	3
				KA/ UC Elective	3
Total		15	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
AE350	Aircraft Structural Analysis	3	AE425	Aerodynamics	3
AE324	Dynamical Systems	3	AE 429	Aircraft Performance and Flight Mechanics	3
AE 301	Experimental Methods in Mechanical & Aeronautical Engineering	1	AE 401	Advanced Experimental Methods in Mechanical & Aeronautical Engineering	3
ES 330	Fluid Mechanics	3	AE 458	Design of Aircraft Structures	1
ES 340	Thermodynamics	3	MA 330*	Advanced Engineering Mathematics*	3
	KA/ UC Elective	3		Undesignated Elective	3
Total		16	Total		16
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
AE 430	Stability Control of Aerospace Vehicles	3		Economics Elective	3
AE431	Gas Dynamics	3	AE451	Aircraft Design II	3

AE 450	Aircraft Design I	3		KA/ UC Elective	3
AE 427	Design of Propulsion Systems	3		Aerospace Professional Elective	3
	Professional Elective	3	ES 499	Professional Experience	0
Total		15	Total		12

**Students can alternatively take MA 331 and (STAT 383 or STAT 389)*

BS In Chemical Engineering

A BS degree in Chemical Engineering is a good foundation for many diverse careers.

The Program Educational Objectives (PEOs) are:

Program graduates are expected to:
PEO1: practice chemical engineering* in continuing and emerging fields and/or

PEO2: be successful in pursuing advanced degrees

PEO3: be motivated to continually develop their knowledge and skills by, for example, taking continuing education or industry training course(s), and acquiring professional engineering certification

PEO4: contribute to society and the engineering profession.

**Here we define chemical engineering as the discipline that requires a thorough grounding in chemistry and a working knowledge of advanced chemistry; material and energy balances applied to chemical processes; thermodynamics of physical and chemical equilibria; heat, mass and momentum transfer; chemical reaction engineering; continuous and stage-wise separation processes; process dynamics and control; process design and appropriate modern experimental and computing techniques.*

The Student Outcomes (SOs) are:

SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Chemical engineers deal with many aspects of an industrial society, especially those challenges involving chemistry. Chemical engineers engage in a spectrum of manufacturing, sales, and research activities in a variety of industries ranging from specialty chemicals to semiconductors and food processing. Therefore, it is essential that they master the fundamentals of chemistry, physics, mathematics, biology, and engineering science. Courses in these fundamentals constitute most of the first year and sophomore year. Junior-year courses concentrate on the application of mathematics, physics, and chemistry to the physical operations and chemical processes required to obtain a desired product on an industrial scale. The senior year is composed chiefly of capstone design and laboratory courses plus electives, permitting students to concentrate on areas in which they have developed a special interest. In the capstone courses, students work in teams on open-ended projects that illustrate how engineering design concepts, introduced in the sophomore and junior chemical engineering courses, are applied in professional practice.

The basic four-year curriculum prepares graduates for immediate employment in a large number of industrial and government organizations as well as for graduate work in chemical engineering or related fields. The positions traditionally filled by chemical engineers involve the design, construction, and management of chemical, petrochemical, pharmaceutical, biochemical and electronics manufacturing plants; research and development of new processes and products; improvement of existing processes and products; design and development of control systems; economic evaluation of new plants and processes; air and water pollution control; energy conservation and energy resource development; and materials engineering. The student

is encouraged to develop a special interest and to take a concentration of courses in that area.

The chemical engineering curriculum is designed to offer sufficient flexibility to satisfy the interests and needs of many different individuals. The curriculum provides students with a solid background for continuing their education to the MS, ME, or PhD degree in chemical engineering, environmental engineering, materials science, and other technical areas. By appropriate selection of electives, the student can also use the chemical engineering program as preparation for graduate work in law, management, medicine, or biotechnology. Personal faculty advising is provided to assist students in the selection of electives that best suit their career goals.

Chemical Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering*					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CH 210	Molecular Properties	3	BY 160	Biology II: Cellular & Molecular Biology	3
CH 220	Material Balances	3	CH 260	Thermodynamics & Energy Balances	3
CM 241	Organic Chemistry I	3	CM 242	Organic Chemistry II	3
MA 231	Calculus III	3	MA 232	Differential Equations	3
	Engineering Science Elective[†]	3		Knowledge Area Elective	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CH 320	Phase Equilibria	3	CH 350	Chemical Engineering Lab I	1
CH 330	Transfer Process Fundamentals	3	CH 360	Chemical Reactor Analysis I	3
CM 244	Organic Chemistry Lab	3	CH 370	Transfer Process Design	3

EC 350	Economic Principles & Engr. Economics‡	3		Math Elective†	3
	Technical Elective†	3		Engineering Science Elective†	3
				Knowledge Area Elective	3
Total		15	Total		16
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
CH 410	Chemical Engineering Lab II	2	CH 430	Chemical Process Safety	3
CH 420	Process Economics & Conceptual Design	3	CH 460	Process Dynamics & Control	3
ES 499	Professional Experience	0		Engineering Elective†	6
	Engineering Elective[1]	3		Undesignated Elective†	3
	Knowledge Area Elective	3			
	Undesignated Elective	3			
Total		14	Total		15

**First Year students in chemical engineering may substitute CM103, 104, and 105 for CM 131 and 132.*

† *The nine elective courses must be approved by the student's faculty advisor and must be distributed as follows: two courses (each from a different field) among materials science, electrical science, and mechanics; one course in mathematics; three courses in engineering; one course in engineering, science, or mathematics; two undesignated electives. An undesignated elective is any course that does not contain a significant amount of material already covered in the student's program. Six credits of advanced (200-level or higher) Aerospace Studies or Military Science Courses may be used to satisfy the requirement for the undesignated electives.*

‡*Satisfies the Knowledge Area "Economics and Organizations" requirement*

Professional Specializations
Students can develop a specialty by proper selection of electives. One very effective choice is a concentration or a minor in another field such as Biomedical Engineering, Biomolecular Engineering, Chemistry, Environmental Engineering, Environmental Health Science, Materials Engineering, Sustainable Energy Systems Engineering, Business, or Communication. Not all courses listed are offered every year. See Professional Concentrations in Engineering and Undergraduate Minors in Engineering.

Chemical Engineering Honors Program
Chemical engineering students with a GPA of 3.5 or better and aiming for an academic or industrial research career may apply to the Honors Program at the end of the sophomore year. Course requirements in addition to the regular curriculum include: CH490 Transport Phenomena, 3 credits of CH390 Undergraduate Research Project (or equivalent), and two math electives (the present elective plus one more) to be chosen from the following list:

CH 561	Chemical Engineering Analysis
ES 505	Design of Experiments and Analysis of Data
MA 331	Fourier Series and Boundary Value Problems
MA 339	Applied Linear Algebra
MA 363	Mathematical Modeling
MA 377	Numerical Methods
MA 381	Probability
STAT 383	Probability and Statistics

BS In Civil Engineering

Civil engineers plan, design, and construct our nation's physical infrastructure and take a leadership role in the responsible development and protection of our natural resources. Accordingly, the field of civil engineering encompasses several distinct disciplinary themes, including architectural engineering, construction engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering, among others.

Civil engineers have always been at the forefront of such activities as designing and constructing bridges, buildings, water and wastewater treatment facilities, hydropower stations, storm drainage systems, airports, aerospace structures, and other public works. They also have taken a leadership role in eliminating the hazardous and solid wastes of society, responsibly developing surface and groundwater resources for beneficial use, managing environmental quality and minimizing the effects of pollutants, mitigating earthquake damage in large structures, and using artificial intelligence to improve the operation of transportation systems. Within the context provided by the broad profession of civil engineering described above, the mission of the Civil and Environmental Engineering Department, formally stated, is to educate talented and motivated people to become successful professionals through quality undergraduate, graduate, and professional continuing education programs that place a high priority on student access and interaction with faculty. This mission statement establishes the educational framework for the civil engineering degree program at Clarkson, and the curriculum objectives given below provide more detail about the program.

Curriculum Objectives

With an appreciation for the disciplinary diversity of Civil Engineering, Clarkson's Department of Civil and Environmental Engineering actively pursues the educational goal of providing talented and motivated people with the knowledge and intellectual tools required to become successful civil engineers. It does so by permitting students to pursue individual disciplinary interests or to remain broadly based in all areas of Civil Engineering while obtaining an accredited BSCE degree (Bachelor of Science in Civil Engineering).

The Program Educational Objectives (PEOs) are:

The Program Educational Objectives support the mission of the Civil and Environmental Engineering Department, which is to educate talented and motivated people to become successful professionals through quality undergraduate, graduate, and professional continuing education programs that place a high priority on student access and interaction with faculty.

PEO1: Graduates will become civil engineering professionals who apply knowledge to meet the challenges of their field.

PEO2: Graduates will become civil engineering professionals who exhibit effective communication, teamwork, and leadership.

PEO3: Graduates will become well-rounded citizens who utilize their education to serve the public good, with an understanding of their professional and ethical responsibilities.

PEO4: Graduates will become civil engineering professionals who exhibit intellectual growth, continued innovation, and a commitment to lifelong learning.

The Student Outcomes (SOs) to Ensure Achievement of PEOs are:

SO1a: Students will have the ability to identify, formulate, and solve complex engineering problems through application of the principles of mathematics (including differential equations), calculus-based physics, chemistry, geospatial representation, applied statistics, and principles of civil engineering. (ABET CRITERION3, outcome 1) (addresses PEO1)

SO1b: Students will be experienced in, and have the ability to develop and conduct appropriate experimentation, including laboratory experimentation, to measure multiple phenomena, analyze and interpret data, and use engineering judgment to draw conclusions. (ABET CRITERION 3, outcome 6) (addresses PEO1)

SO1c: Students will have the ability to apply engineering design to produce solutions that meet specified needs for the public good[1]. (ABET CRITERION 3, outcome 2) (addresses PEO1)

SO1d: Students will have the ability to apply learning strategies and modern engineering tools, to identify, formulate, and design solutions for complex engineering problems. (ABET CRITERION 3, outcome 7) (addresses PEO1)

SO1e: Students will have basic proficiency in at least four of the recognized civil focus areas. (Specific program criteria, IMPLIED IN ABET CRITERION 3, outcomes 1, 2, and 6. Addresses in part ABET Criterion 5(c)) (addresses PEO1)

SO1f: Students will have an ability to think creatively, consider risks, make trade-offs, and use informed judgment for the public good while functioning as an individual or on a team to solve complex engineering problems and produce engineering designs. (ABET CRITERION 3, outcomes 1, 4, 5, 7, and IMPLIED IN ABET CRITERION 3, outcomes 2 and 6.) (addresses PEO1)

SO2a: Students will have the ability to organize effective and concise engineering reports and memos for a range of audiences (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2b: Students will have the ability to organize and deliver engineering work in formal oral presentations to a range of audiences. (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2c: Students will have the ability to function effectively on diverse, multi-disciplinary teams, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives towards engineering design solutions that meet specified needs with consideration of the public good. (ABET CRITERION 3, outcomes 3 and 5) (addresses PEO2)

SO3a: Students will have the ability to recognize and practice ethical, professional, and environmental responsibility in engineering problem solving, evaluation, and design based upon knowledge of the humanities and exposure to, and understanding of, environmental quality as well as the NSPE Code of Ethics for Professional Engineers. (ABET CRITERION 3, outcomes 1, 2, and 4) (addresses PEO3)

SO3b: Students will have the ability to understand the impact of engineering solutions on and make informed judgments that consider the public good. (ABET CRITERION 3, outcomes 2, and 4) (addresses PEO3)

SO4a: Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (ABET CRITERION 3, outcome 7) (addresses PEO4)
[1] "The public good": In the practice of engineering consideration of public health, safety, and welfare, as well as global, national, cultural, social, environmental, and economic factors.

It is expected that graduates from the BSCE program will demonstrate achievement of these objectives within a few years after completing the program. Science and engineering-science courses form the majority of the curriculum in the first two years. These courses provide the base for the professionally-oriented courses in the junior and senior years. The curriculum is designed to provide all graduates with a theoretical foundation as well as design experiences in structural, geotechnical, water resources, and environmental engineering. This foundation is typically achieved in the junior year, enabling students to use the senior year to select elective courses in areas where their particular interests have developed. In the senior year, a capstone design course maximizes development of design skills that were first introduced in the sophomore year and enhanced in subsequent courses. Students can select elective courses in areas beyond the required courses, such as transportation, or can use the elective portion of the curriculum to concentrate in selected areas such as construction engineering (including infrastructure and architectural engineering tracks), structural engineering, water resources engineering, or environmental engineering.

The guiding principle is that the student and faculty advisor together create a program of study that best satisfies the student's individual career objectives.

Civil Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CE 212	Introduction to Engineering Design	3	CE 305	Construction Planning and Management	3
CE 301	Introduction to Geospatial Analysis and Geographic Information Systems	3	ES 222	Strength of Materials	3
ES 220	Statics	3	ES 330	Fluid Mechanics	3
MA 231	Calculus III	3	MA 232	Elementary Differential Equations	3
	KA/ UC Elective	3		ES Elective[1]	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CE 320	Structural Analysis with Lab	3	CE 310	Geotech. Engineering I: Soil Mechanics with Lab	3
CE 330	Water Resources Engineering I with Lab	3	CE 340	Intro to Environmental Engineering	3

STAT 383	Probability and Statistics	3	CE 441 CE 442	Reinforced Concrete Design Steel Design	3/3
	KA/ UC Elective	3		ES Elective[1]	3
	Science Elective[2]	3		Professional Elective[3]	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
EC 350	Economic Principles and Engineering Economics	3	CE 490/ CE 491	Senior Design	3
	Professional Electives[3]	9		KA/ UC Elective	3
ES 499	Professional Experience	0		Professional Electives[3]	9
	ES Elective[1]	3			
Total		15	Total		15

[1]Eligible ES Electives are: ES 223 Rigid Body Dynamics, ES 250 Electrical Science, ES 260 Materials Science and Engineering I, ES 340 Thermodynamics.
[2]Science Elective: Any 3-credit or greater BY course, CE 315 Geology for Engineers, CE 316 Earth's Dynamic Climate: Science & Impacts, or per approved CEE science elective list.
[3]A total of 16.5 design credits are required to be accumulated. Required courses provide 12.5 design credits.

Professional Specializations
Through the selection of electives, students can achieve proficiency in particular areas of interest. Elective courses can be selected from those offered by the Civil and Environmental Engineering Department and by other departments. Those electives considered especially appropriate to the various areas of specialization in civil engineering are provided in the following topical listings. Not all courses are offered each year or each semester (see annual Courses publication). All 500-numbered courses are graduate level. Undergraduate students enrolled in 500-level courses must

have a cumulative grade-point average of at least 3.0, and permission of their advisor and their department chair. To enroll in a 600-numbered course, undergraduates must have a cumulative grade-point average of at least 3.5 and permission of their advisor, department chair, and the dean of Engineering.

Professional Concentrations in Civil Engineering

Construction Engineering Management

Four required courses including:	
CE 411	Construction Materials Engineering
CE 415/ 515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
Choose at least one of the following non-CE courses:	
COMM 217	Introduction to Public Speaking
EHS 330	Occupational Safety and Ergonomics
EM/OM 380	Project Management
EM/OM 451	Quality Management and Lean Enterprise
FN 361	Financial Management
LW 270	Law and Society I
OS 286	Organizational Behavior I
LW 466	The Law of the Workplace
Completion of at least one of these two tracks:	
1. Construction/ Infrastructure Track:	
Choose at least two of the following:	
CE 302	Surveying, Geodetic Control, and Engineering Measurements

CE 304	Introduction to Scheduling and Estimating
CE 315	Geology for Engineers
CE 404	Applications in Scheduling and Estimating
CE 406	Infrastructure Construction
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 410/510	Sustainable Infrastructure and Building
CE 453/553	Properties and Performance of Concrete Materials
CE 461	Transportation Systems Design
2. Architectural Engineering & Building Construction Track	
Choose at least two of the following:	
CE 304	Introduction to Scheduling and Estimating
CE 404	Applications in Scheduling and Estimating
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 409	Fundamentals of Building Systems
CE 410/510	Sustainable Infrastructure and Building
CE 448	Introduction to Architectural Engineering

Structural Engineering

Five required courses including:	
CE 420/520	Computational Methods of Structural Analysis
CE 415/515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
CE 490/491	Senior Design with Structures Focus or approved alternate
Choose at least two of the following:	
CE 408	Building Information Modeling(BIM) and Integrated Project Delivery(IPD)
CE 411	Construction Materials Engineering
CE 445	Timber Design
CE 448	Introduction to Architectural Engineering
CE 452/552	Advanced Strength of Materials
CE 453/553	Properties & Performance of Concrete Materials
CE 501	Fracture Mechanics of Concrete Structures
CE 512	Structural Dynamics
CE 521	Advanced Mechanics of Composite Materials
CE 538	Finite Element Methods
CE 541	Bridge Engineering
CE 549	Experimental Methods in Structures
CE 555	Structural Damage Assessment, Rehabilitation, and Repair

Water Resources Engineering

Four required courses including:	
CE 430	Water Resources Engineering II
CE 470	River Restoration
CE 479	Water and Wastewater Treatment Design
CE 490/ 491	Senior Design with Water Resources Focus or approved alternate
Choose any two from the following:	
CE 315	Geology for Engineers
CE 340	Introduction to Environmental Engineering
CE 380	Fundamentals of Environmental Engineering
CE 434	Sustainable Development Engineering
CE 435	Groundwater Hydrology and Geochemistry
CE 478	Solid Waste Management and Landfill Design
CE 481/581	Hazardous Waste Management and Engineering
CE 482/582	Environmental Systems Analysis and Design
And choose at least one from the following:	
BY/EV 330	Great Lakes Water Protection
BY 431	Limnology
ES 436	Global Climate Change: Science, Engineering & Policy
COMM 428	Environmental Communication
EV 305	Sustainability & the Environment
PHIL 370	Environmental Ethics
POL 374	Environmental Political Theory
POL 375	Environmental Law
POL 470	Environmental Policy

Civil Engineering majors may also sign up for minors in Architectural and Facilities Engineering and/or Environmental Engineering.

Standard length of BS in Civil Engineering is four years, or eight semesters.

BS In Computer Engineering

The objective of the undergraduate program in computer engineering is to prepare students for careers as professional engineers and to provide a base for graduate study and for lifelong learning in new and developing specialties.

The Program Educational Objectives (PEOs) are:

PEO1: Graduates of the Computer Engineering program are expected to have advanced their careers as contributing professionals who apply hardware and software knowledge strengthened with analytical problem-solving skills in a wide variety of practical applications.

PEO2: Graduates of the Computer Engineering program are expected to have become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities.

PEO3: Graduates of the Computer Engineering program are expected to have become effective and responsible collaborators who function well in diverse team environments. Some graduates will have emerged as leaders in their field.

PEO4: Graduates of the Computer Engineering program are expected to have exhibited intellectual growth and pursue continual innovation in computing systems. Those graduates who are extraordinarily talented and motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

The Student Outcomes (SOs) are:
prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

SO2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

SO3: an ability to communicate effectively with a range of audiences

SO4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

We expect that within a few years after completing the program our Graduates will become:

Contributing Professionals
Graduates are expected to have advanced their careers as professionals who apply fundamental engineering knowledge and analytical problem solving skills in a wide variety of practical applications.

Well-Rounded Citizens
Graduates are expected to have become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities.

Effective and Responsible Collaborators
Graduates are expected to have become effective and responsible collaborators who function well in diverse team environments. Some graduates will have emerged as leaders in their field.

Intellectual Growth
Graduates are expected to have exhibited intellectual growth and pursue continual innovation in their field. Those graduates who are motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

The degree program in computer engineering fosters the achievement of these objectives in two ways. First, the curriculum as a whole is comprised:

1. A coherent program of required courses in basic science, mathematics, and engineering science, including laboratory experience in the use of modern equipment

2. Education in the humanities, social sciences, ethical principles and management, with special attention to the development of effective written and oral communication skills
3. The elective coursework in several of the major sub-disciplines of electrical, computer and software engineering encourages the pursuit of individual interests and provides an opportunity to gain further knowledge in these sub-disciplines
4. Experiences that facilitate the development of problem-solving, teamwork and engineering design skills with the aid of modern analysis and design tools, and experiences that encourage students to become active alumni and to develop a commitment to lifelong learning

Basic and required courses are taken during the first two years, along with some introductory professional courses, including an engineering laboratory. Laboratory courses are required in both of these years with a strong emphasis on engineering design. The third and fourth years include both required and elective technical courses.

The Clarkson Common Experience is addressed in the first year with the Clarkson Seminar and ES110 Engineering and Society. Five knowledge area courses, including a university course, are required over the four years of study. One of these knowledge area courses must be in economics and one must be ES110. The Clarkson Common Experience is designed, in part, to develop communication, problem-solving, and critical-thinking skills and an understanding of the social, ethical and economic implications of an engineer's work.

Second, the computer engineering program is constructed so that each student develops a working knowledge of engineering design based on a broad spectrum of concepts, principles, and techniques balanced in hardware, software, and systems, along with a strong set of communication and teamwork skills. This is done through a program of study with the following characteristics:

1. In the required courses, students are expected to master the fundamentals of hardware design.Hardware design principles are introduced in courses that treat hardware concepts and analysis that is followed by work in logic design and laboratory experiences in which students must design and build small systems using logic circuits, programmable logic devices and embedded systems. Elements common to hardware and software are stressed and hardware/software tradeoffs are addressed in this segment of the curriculum
2. Sound software engineering principles are introduced and reinforced with required courses that treat object-oriented design, data structures, standardized components and system software. Students gain experience working in modern software development environments and using modern design tools. In the required course sequence, students learn C/C++, Python and Java in the context of modern integrated development environments, gain experience in embedded and FPGA system design and industry-standard simulation, synthesis, debugging and verification tools in their design projects.

3. Students develop their teamwork and communication skills. They do so in part through coursework that requires them to communicate effectively in written form and in part through coursework involving team-based design, written communication of their design decisions, and oral presentation of their work. The design experiences require that students work in teams of varying sizes , collaborating with others on teams whose composition is determined by their instructors. By participating in team-based problem solving of this kind, with individuals they did not choose as teammates, students learn to work with individuals in multiple situations, thereby developing their teamwork skills
4. Students develop the ability to design an integrated hardware/software system to meet desired specifications. They engage in a major design experience that emulates an industrial design environment. In this design experience, students design and implement a digital system's hardware and software components. This team-oriented task demands that students learn to work with others in completing a system design that meets specifications on time. The system specifications often require that students interact with individuals from other disciplines to design an acceptable product.
5. Students engage in activities that foster an appreciation for the importance of extracurricular and community involvement. They are actively encouraged to become involved with professional societies, service organizations, and other extracurricular activities and also to take advantage of the close interpersonal environment that the department fosters. We require our students to obtain professional experience prior to graduation, either through an internship or by participating in the co-op program. Further, we encourage our students to participate in engineering projects on campus through undergraduate research, suitable on-campus work experience, and technical extracurricular activities such as the US First Robotics competition.

Computer Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering*					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
ES 250	Electrical Science	3	EE 211	ECE Lab I	3
EE 262	Intro to Digital Design	3	EE 221	Linear Circuits	3
ES 264	Intro to Object Oriented Programming and Software Design	3	EE 260	Embedded Systems	3
MA 232	Differential Equations	3		KA/UC Elective (EC)	3
	KA/ UC Elective	3	MA 231	Calculus III	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
EE 321	Systems and Signal Processing	3	EE 316	Computer Engineering Junior Lab	3
EE 341	Microelectronics	3	EE 466	Computer Architecture	3
EE 363	Software Components and Generic Programming	3	MA 211	Foundations	3
EE 365	Advanced Digital Circuit Design	3	EE 462	Software Systems Architecture	3
STAT 383	Probability and Statistics	3	EE361	Fundamentals of Software Engineering	3
Total		15	Total		15

Seventh Semester		Credits	Eighth Semester		Credits
EE 416	Computer Engineering Senior Lab	3		Professional Electives[3]	6
	ES or Science Elective	3		KA/ UC Elective[1]	3
EE 464	Digital Systems Design	3		Free Electives[4]	6
ES 499	Professional Experience	0			
	CS Elective[2]	3			
	KA/ UC Elective[1]	3			
Total		15	Total		15

**Computer Engineering students must select CS 141 from the available list of Second Semester Science/CS elective courses numbered CM 132/ BY 160/ CS 141.*
[1]There are a total of five courses which must be taken to cover at least four knowledge areas. At least one of these courses must be a University Course. University courses are interdisciplinary courses that cover two or more knowledge areas. One of the knowledge area electives must be an economics course, EC 350 is recommended, and one must be ES 110.
[2]The Computer Science Elective must be selected from computer science courses numbered 300 or higher or CS 242.
[3]The Professional Electives are ECE courses numbering 300 or higher, or other engineering courses if approved by the ECE Department.
[4]The Undesignated Electives are fulfilled by college level courses that do not contain a significant amount of material already covered elsewhere in the student's program.
[5]The Engineering Science Elective is satisfied by the selection of an ES course approved by the ECE Department.

See Academic Requirements for details of the Clarkson Common Experience, including the First-Year seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), and related requirements and professional experience.

Professional Specializations.
The courses offered by the Department of Electrical and Computer Engineering can be grouped into sub-disciplines , with each sub-discipline including a combination of required and elective courses at the undergraduate level. Note that a number of these courses cross sub-discipline boundaries. Examples of the specializations are shown in the table below. A complete description of currently available courses is available online on the ECE intranet webpage.

Qualified undergraduate students are encouraged to take graduate-level courses within their area of interest. Undergraduate students enrolled in 500- level courses must have a cumulative grade-point average of at least 3.0 and the permission of their advisor and their department chair. To enroll in a 600-numbered course, undergraduates must have a cumulative grade-point average of at least 3.5 and must have the permission of their advisor, department chair, and the dean of Engineering

Biomedical Engineering	
BR 400	Introduction to Biomedical Rehabilitation Engineering and Science
EE 465	Computer Graphics
EE 466	Computer Architecture
EE 468	Database Systems
EE 485	Neural Engineering
Communication Systems and Signal Processing	
EE 401	Digital Signal Processing
EE 404	Wireless Networks
EE 407	Computer Networks
EE 427	Introduction to Digital Image Processing
EE 470	Coding and Information Transmission
EE 471	Principles of Digital Data Communications
Control Systems	
EE 450	Control Systems
EE 451	Digital Control

EE 452	Optimization Techniques in Engineering
Electronics and Circuits	
EE 441	Electronic Devices for IC Simulation
EE 442	CMOS IC Design
EE 448	Solar Cells
EE 449	Fundamental of Antenna Engineering
Computer Engineering	
EE 368	Software Engineering
EE 407	Computer Networks
EE 408	Software Design for Visual Environments
EE 410	Computer and Network Security
EE 461	Many-Core Architecture and Programming Model
EE 462	Software Systems Architecture
Power Engineering	
EE 333	Power System Engineering
EE 430	High-Voltage Techniques and Measurements
EE 431	Power Distribution and Utilization
EE 438	Alternate Energy Systems
EE 439	Dielectrics

BS In Electrical Engineering

The objective of the undergraduate program in electrical engineering is to prepare students for careers as professional engineers and to provide a base for graduate study and lifelong learning in new and developing specialties.

The Program Educational Objectives (PEOs) are:

PEO1: Electrical engineering graduates are expected to apply fundamental electrical engineering knowledge and analytical problem-solving skills in a wide variety of practical applications.

PEO2: Electrical engineering graduates are expected to become well-rounded citizens who rely on their electrical engineering education to serve society with an understanding of their professional and ethical responsibilities.

PEO3: Electrical engineering graduates are expected to contribute their Electrical Engineering expertise effectively as members of engineering teams in diverse environments through communications, teamwork, and leadership.

PEO4: Electrical engineering graduates are expected to continuously engage in professional development, to exhibit intellectual growth, and to pursue life-long learning through educational endeavors and participation in professional societies and organizations.

The Student Outcomes (SOs) are:

To prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

SO2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

SO3: an ability to communicate effectively with a range of audiences

SO4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

We expect that within a few years after completing the program, our graduates will become:

Contributing Professionals
Graduates are expected to have advanced their careers as professionals who apply fundamental engineering knowledge and analytical problem-solving skills in a wide variety of practical applications.

Well-Rounded Citizens
Graduates are expected to have become well-rounded citizens who rely on their engineering education to serve society with an understanding of their professional and ethical responsibilities.

Effective and Responsible Collaborators
Graduates are expected to have become effective and responsible collaborators who function well in diverse team environments. Some graduates will have emerged as leaders in their field.

Intellectual Growth
Graduates are expected to have exhibited intellectual growth and pursue continual innovation in their field. Those graduates who are motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

The degree program in electrical engineering fosters the achievement of these objectives in two ways. First, the curriculum as a whole is comprised of:

1. A coherent program of required courses in basic science, mathematics, and engineering science, including laboratory experience in the use of modern equipment
2. Education in the humanities, social sciences, ethical principles and management, with special attention given to the development of effective written and oral communication skills
3. The elective coursework in several of the major subdisciplines of electrical and computer engineering encourages the pursuit of individual interests and provides an opportunity to gain further knowledge in these subdisciplines
4. Experiences that facilitate the development of problem solving, teamwork, and engineering design skills with the aid of modern analysis and design tools
5. Experiences that encourage students to become active alumni and to develop a commitment to lifelong learning

Basic and required courses are taken during the first two years, along with introductory professional courses, including an engineering laboratory. The third and fourth years include both required and elective technical courses.

The Clarkson Common Experience is addressed in the first year with the Clarkson Seminar and ES110 Engineering and Society. Five knowledge area courses, including a university course, are required over the four years of study. One of these knowledge area courses must be in economics and one must be ES110. The Clarkson Common Experience is designed, in part, to develop communication, problem-solving, and critical-thinking skills and an understanding of the social, ethical and economic implications of an engineer's work.

Second, the electrical engineering program is constructed so that each student develops a depth of knowledge in the discipline that is built upon mastery of the material in fundamental required courses, a base of experience using state of the art software and engineering tools, the ability to design an engineering system to meet desired specifications, and the ability to communicate effectively and work as a member of an engineering team. This is done through a program of study with the following characteristics:

1. In the required courses, students are expected to master the essential topics that are needed in the courses that follow. In these courses, students are expected to gain a firm grounding in basic electrical and computer engineering (reinforced with laboratory experience) and then take a set of intermediate courses that treat topics in systems and signal processing energy conversion, electromagnetic fields, and microelectronics. Each student then develops their own interests further by taking a pair of advanced courses in a chosen area of the discipline to gain depth in that area while also taking courses in other areas of the discipline to ensure breadth of coverage.
2. Students gain experience in using state-of-the-art software and engineering tools. They encounter C/C++ programming, MATLAB, Pspice, FPGA and embedded system design early in their program of study and continue to use these methods throughout many of their required courses. Students develop their teamwork and communication skills. They do so in part through coursework involving team-based design, written communication of their design decisions, and oral presentation of their work. The design experiences require that students work in teams of varying sizes. By participating in team-based problem solving of this kind, with individuals they may not have chosen as teammates, students learn to work with individuals in multiple situations, thereby developing their teamwork skills.
3. Students develop the ability to design an engineering system to meet desired specifications. They engage in a major design experience in which they design and build an engineering system. The specific type of system varies, as projects are chosen from various application areas relevant to the discipline. These

team-oriented tasks demand that students learn to work with others in completing a system design that meets specifications on time. The system specifications may require that students interact with individuals from other disciplines to design an acceptable product.

4. Students engage in activities that foster an appreciation for the importance of extracurricular and community involvement. They are actively encouraged to become involved with professional societies, service organizations, and other extracurricular activities and also to take advantage of the close interpersonal environment that the department fosters. We require our students to obtain professional experience before graduation, either through an internship or by participating in the co-op program. Additionally, we encourage our students to participate in engineering projects on campus through undergraduate research, suitable on-campus work experience, and technical extracurricular activities such as the US First Robotics competition.

Electrical Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering*					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
EE 262	Intro to Object Oriented Programming and Software Design	3	EE 211	ECE Lab I	3
EE 264	Intro to Digital Design	3	EE 221	Linear Circuits	3
ES 250	Electrical Science	3	EE 260	Embedded Systems	3
MA 232	Differential Equations	3	EE 324	Dynamical Systems	3
	KA/ UC Elective[1]	3	MA 231	Calculus III	3
Total		15	Total		15

Fifth Semester		Credits	Sixth Semester		Credits
EE 311	EE Junior Lab	3	EE 381	Electromagnetic Fields and Waves	3
EE 321	Systems and Signal	3		Area elective[2]	3
EE 331	Energy Conversion	3		Math Elective[3]	3
EE 341	Microelectronics	3		ES or Science Elective[4]	3
STAT 383	Probability and Statistics	3		KA/ UC Elective	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
EE 412	EE Senior Design/ Area Elective	3	EE 412	Senior Design/ Area Elective	3
ES 499	Professional Experience	0		Area Elective	3
	ES Elective	3		KA/ UC Elective	3
	KA/ UC Elective	3		Free-electives	6
	Area Electives	6			
Total		15	Total		15

**Electrical Engineering students must select CS 141 from the available list of Second Semester Science/ CS elective courses numbered CM 132/ BY 160/ CS 141.*

[1] There are a total of five courses which must be taken to cover at least four knowledge areas. At least one of these courses must be a University Course. University Courses are interdisciplinary courses that cover two or more knowledge areas. One of the knowledge area electives must be an Economics course, EC 350 is recommended and one should be ES 110.

[2] There are five Area Electives which must be selected as follows: At least two from a single area of concentration within the electrical and computer engineering discipline, and one from a different area of electrical and computer engineering. The remainder may be chosen in any combination from any of the areas of electrical and computer engineering.

A list of appropriate courses within those areas is available from the ECE Department and is contained in the ECE Undergraduate Student Handbook.
[3] The Mathematics Elective may be MA 211 or numbered 300 level or higher and must include a significant amount of mathematical theory.
[4] The Engineering Science Electives are satisfied by ES courses approved by the ECE Department.
[5]The undesignated electives are fulfilled by college-level courses that do not contain a significant amount of material already covered elsewhere in the student's program.

See Academic Requirements for details of the Clarkson Common Experience, including the First-Year Seminar, The Clarkson Seminar, Knowledge Area (KA) courses, University Courses (US), Professional Experience, and related requirements.

Professional Specializations

The courses offered by the Department of Electrical and Computer Engineering can be grouped into sub-disciplines, with each sub-discipline including a combination of required and elective courses at the undergraduate level. Examples of these specializations are shown in the table below. A complete description of currently available courses can be found online on the ECE intranet webpage. Undergraduate students enrolled in 500-level courses must have a cumulative grade-point average of at least 3.0, and the permission of their advisor and their department chair. To enroll in a 600-numbered course, undergraduates must have senior standing, a grade-point average of at least 3.5, and must have the permission of their advisor, department chair, and the Dean of Engineering. See Professional Concentrations in Engineering.

Biomedical Engineering	
BR 400	Introduction to Biomedical Rehabilitation Engineering and Science
EE 465	Computer Graphics
EE 466	Computer Architecture
EE 468	Database Systems
EE 485	Neural Engineering
Communication Systems and Signal Processing	
EE 401	Digital Signal Processing
EE 407	Computer Networks
EE 470	Coding and Information Transmission
EE 471	Principles of Digital Data Communications
Control Systems	
EE 450	Control Systems
EE 451	Digital Control
EE 452	Optimization Techniques in Engineering
Electronics and Circuits	
EE 441	Electronic Devices for IC Simulation

EE 442	CMOS IC Design
Computer Engineering	
EE 361	Fundamentals of Software Engineering
EE 363	Software Components and Generic Programming
EE 365	Advanced Digital Circuit Design
EE 368	Software Engineering
EE 407	Computer Networks
EE 408	Software Design for Visual Environments
EE 410	Computer and Network Security
EE 461	Many-Core Architecture and Programming Model
EE 462	Software Systems Architecture
Power Engineering	
EE 333	Power System Engineering
EE 430	High-Voltage Techniques and Measurements
EE 431	Power Distribution and Utilization
EE 438	Alternate Energy Systems
EE 439	Dielectrics

BS In Environmental Engineering

Environmental engineers provide the knowledge, leadership, and guidance needed to improve the quality and ensure the sustainability of our natural world — from the water we drink, to the air we breathe, to the soil that produces our life-sustaining vegetation. Environmental engineers play a major — and increasingly proactive — role in prevention and control of pollution of all kinds and in efforts to deal with global warming.

Environmental engineers develop and implement technologies to solve problems like meeting clean water supply needs and protecting public health, addressing the air pollution issues of acid rain and global warming, and reducing pollution while maintaining and improving the quality of life we enjoy.

The mission of the Civil and Environmental Engineering Department, formally stated, is to educate talented and motivated people to become successful professionals through quality undergraduate, graduate and professional continuing education programs that place a high priority on student access and interaction with faculty. This mission statement establishes the educational framework for the environmental engineering degree program at Clarkson, and the curriculum objectives given below provide more detail about the program.

Curriculum Objectives

The Environmental Curriculum is designed for a career in environmental research, system modeling, or process design. All Environmental Engineering majors are provided with a theoretical foundation as well as design experience in the area of water resources, environmental quality, systems, hazards and treatment processes. This foundation is typically achieved in the junior year and enables students to use the senior year to select elective courses in areas where their particular interests have developed. In the senior year a capstone design course maximizes the development of design skills.

The Program Educational Objectives (PEOs) are:

The Program Educational Objectives support the mission of the Civil and Environmental Engineering Department which is to educate talented and motivated people to become successful professionals through quality undergraduate and graduate and professional continuing education programs that place a high priority on student access and interaction with faculty.

PEO1: Graduates will become environmental engineering professionals who apply knowledge to meet the challenges of their field.

PEO2: Graduates will become environmental engineering professionals who exhibit effective communication, teamwork, and leadership.

PEO3: Graduates will become well-rounded citizens who utilize their education to serve the public good, with an understanding of their professional and ethical responsibilities. [1]

PEO4: Graduates will become environmental engineering professionals who exhibit intellectual growth, continued innovation, and a commitment to lifelong learning.

The Student Outcomes (SOs) to Ensure Achievement of PEOs are:

SO1a: Students will have the ability to apply knowledge of mathematics through differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), earth science, biological science, and fluid mechanics, formulate material and energy balances, and analyze the fate and transport of substances in and between air, water, and soil phases (ABET CRITERION3, outcome 1) (addresses PEO1)

SO1b: Students will be experienced in, and have the ability to develop and conduct appropriate experimentation, including laboratory experimentation, to measure multiple phenomena, analyze and interpret data, and use engineering judgment to draw conclusions. (ABET CRITERION 3, outcome 6) (addresses PEO1)

SO1c: Students will have the ability to apply engineering design to produce solutions that meet specified needs for the public good[1]. (ABET CRITERION 3, outcome 2) (addresses PEO1)

SO1d: Students will have the ability to apply learning strategies and modern engineering tools, to identify, formulate, and design solutions for complex engineering problems. (ABET CRITERION 3, outcome 7) (addresses PEO1)

SO1e: Students will have basic proficiency in more than one environmental engineering focus area (e.g., air, water, land, or environmental health). (Specific program criteria, IMPLIED IN ABET CRITERION 3, outcomes 1, 2, and 6; Addresses in part ABET Criterion 5(c)) (addresses PEO1)

SO1f: Students will have an ability to think creatively, consider risks, make trade-offs, and use informed judgment for the public good while functioning as an individual or on a team to solve complex engineering problems and produce engineering designs. (ABET CRITERION 3, outcomes 1, 4, 5, 7, and IMPLIED IN ABET CRITERION 3, outcomes 2 and 6.) (addresses PEO1)

SO2a: Students will have the ability to organize effective and concise engineering reports and memos for a range of audiences (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2b: Students will have the ability to organize and deliver engineering work in formal oral presentations to a range of audiences. (ABET CRITERION 3, outcome 3) (addresses PEO2)

SO2c: Students will have the ability to function effectively on diverse, multi-disciplinary teams, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives towards engineering design solutions that meet specified needs with consideration of the public good. (ABET CRITERION 3, outcomes 3 and 5) (addresses PEO2)

SO3a: Students will have the ability to recognize and practice ethical, professional, and environmental responsibility in engineering problem solving, evaluation, and design based upon knowledge of the humanities and exposure to, and understanding of, environmental quality as well as the NSPE Code of Ethics for Professional Engineers. (ABET CRITERION 3, outcomes 1, 2, and 4) (addresses PEO3)

SO3b: Students will have the ability to understand the impact of engineering solutions on and make informed judgments that consider the public good. (ABET CRITERION 3, outcomes 2, and 4) (addresses PEO3)

SO4a: Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (ABET CRITERION 3, outcome 7) (addresses PEO4)

[1] "The public good": In the practice of engineering consideration of public health, safety, and welfare, as well as global, national, cultural, social, environmental, and economic factors.

It is expected that graduates from the BSEnvE program will demonstrate achievement of these objectives within a few years after completing the program.

Science and engineering-science courses form the majority of the curriculum in the first two years. These courses provide the base for the professionally oriented courses in the junior and senior years. Through the selection of electives, students can take courses in an area of environmental engineering that is not covered by required courses, such as Air Pollution Control and Industrial Hygiene. The Environmental Engineering curriculum provides for six professional electives. These elective courses enable students to create programs of study unique to each individual as well as provide both depth and breadth in the student's preparation for professional practice. In the senior year, a capstone design course maximizes the development of design skills that were first introduced in the sophomore year and enhanced in subsequent courses. The guiding principle is that the student and faculty advisor together create a program of study that best satisfies the student's individual career objectives.

Environmental Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering					
Third Semester		**Credits**	**Fourth Semester**		**Credits**
CH 210	Molecular Properties	3	CE 340	Introduction to Environmental Engineering	3
CE 212	Introduction to Engineering Design	3	CE 380	Fundamentals of Environmental Engineering with Lab	3
ES 220	Statics	3	ES 330	Fluid Mechanics	3
MA 231	Calculus III	3	MA 232	Elementary Differential Equations	3
	KA/ UC Elective	3		KA/ UC Elective	3
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
CE 330	Water Resources Engineering I with Lab	3	BY 320	Microbiology	3
CM 241 or CM 221	Organic Chemistry I Spectroscopy	3	CE 301	Introduction to Geospatial Analysis and Geographic Information Systems	3
CE 479	Water & Wastewater Treatment Design	3	ES 340	Thermodynamics	3
STAT 383	Probability and Statistics	3		Core Professional Course[2]	3
	Earth Science Elective[1]	3		KA/ UC Elective	3

Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
EC 350	Economic Principles and Engineering Economics	3	CE 491	Senior Design	3
	Core Professional Course[2]	3		Core Professional Course[2]	3
	Professional Electives[3]	9		Professional Electives[3]	9
Total		15	Total		15

[1]Earth Science Elective must be one of these: CE 315 Geology for Engineers, CE 316 Earth's Dynamic Climate: Science & Impacts, ES 436 Global Climate Change: Science, Engineering and Policy, CE 477 Atmospheric Chemistry
[2]Core Professional Courses must include three of these courses: CE 482/582 Environmental Systems Analysis and Design, CE 486/586 Industrial Ecology, ES 432 Risk Analysis, CE 481/581 Hazardous Waste Management Engineering.
[3]A total of 16.5 design credits are required to be accumulated. Required courses provide 10.5 design credits.

BS In Mechanical Engineering

The Program Educational Objectives (PEOs):
The educational objectives for the ME program are to produce graduates who:

PEO1: competently apply engineering methods to solve professional problems associated with the design, development, manufacture, and maintenance of mechanical systems and understand the social, ethical, and environmental context of their work.

PEO2: communicate clearly with diverse and international communities, collaborate competently in cross-functional teams, and assume leadership roles while meeting the expectations of their employers.

PEO3: habitually engage in professional development.

The Student Outcomes (SOs):
In order to prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The Mechanical engineering program expects the student to graduate with the ability to: apply principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations) to model, analyze, design, and realize physical systems, components or processes; and work professionally in both thermal and mechanical systems.

Curriculum Overview
The 120-credit program contains 84 credit hours of required technical courses, 36 credit hours of electives (including four professional electives, two undesignated electives and five Knowledge Area/University Course, KA/UC, electives).

Required Technical Courses
The first two years of the curriculum cover mathematics, physics, chemistry and engineering science courses (including basic principles of statics, dynamics, solid mechanics, electrical circuits, materials and the use of computers). In the third and fourth years, students take specialized courses on topics such as fluid mechanics and mechanical vibrations and control. These courses provide knowledge and skills that strongly support the second outcome listed above, which is a key element in thermo-mechanical systems design. The laboratory components of the first-year physics and chemistry courses introduce study of the relationship between theory and

reality. This fosters the development of the student's technical intuition. Mechanical engineering laboratory courses add to this development.

Training in professional problem-solving begins in the spring of the second year, with the first course in engineering design. The first course to train students formally in the solution process, it lays the foundation for the fourth-year capstone design course. In the capstone course, students work in teams to design and evaluate thermo-mechanical systems that meet real needs. Thus, they learn to apply the solution process to a real professional problem. Students may acquire additional professional experience by participating in Formula SAE, Mini-Baja, Clean Snowmobile, or other team competitions, which are open to any student.

Common Curriculum Requirements
Plans of study must include a total of five Knowledge Area (KA) courses. Students will select these so that at least one is a designated University Course, and so that together these five courses cover at least four distinct knowledge areas. Communication intensive course requirements will be fulfilled by a combination of courses having one or two communication points each, with a total of six points required for graduation. At least two of these six points will be earned through or 400-level courses required in the major.

Professional and Undesignated Electives
The professional electives must be advanced-level courses chosen according to criteria in the Mechanical & Aeronautical Engineering (MAE) Department Student Handbook. Up to two 400-level Aerospace Studies or Military Science courses may be used as professional electives. The two undesignated electives may be any college-level courses that do not contain a significant amount of material already covered in other courses. They could be chosen to enrich the student's technical or nontechnical background. Aerospace Studies or Military Science courses (200-level or higher) may be used as undesignated electives.

Mechanical Engineering Curriculum					
First Year see Common First-Year Curriculum in Engineering					
First Semester		**Credits**	**Second Semester**		**Credits**
MS/ AS	Military Science/ Aerospace Studies (if elected)	1	MS/ AS	Military Science/ Aerospace Studies (if elected)	1
Third Semester		**Credits**	**Fourth Semester**		**Credits**
ES 220	Statics	3	ES 222	Strength of Materials	3

ES 250	Electrical Science	3	ES 223	Rigid Body Dynamics	3
ES 260	Materials Science	3	ME 212	Into. To Engineering Design	3
MA 232	Elem. Differ Equations	3	ME 201	Mech. Engineer Lab I	1
	KA/ UC Elective	3	MA 231	Calculus III	3
				KA Elective	3
Total		15	Total		16
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
ES 330	Fluid Mechanics	3	ME 310/ ME 455	Thermodynamics Sys. Eng Mechanical Vibration and Control	3
ES 340	Thermodynamics	3	ME 326	Intermediate Fluid Mechanics	3
MA 330*	Adv. Engineer. Math*	3	ME 341	Mech. Of Machine Elements	3
ME 301	Mech. Engineer. Lab II	1	ME 401	Mech. Engineer. Lab III	1
ME 342	Intro. Numerical Methods	3	ME 445	Integrated Design I	3
	KA/ UC Elective	3		Professional 1 Elective	3
Total		16	Total		16
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
ME 411	Intro. to Heat Transfer	3		Professional Elective	3
ME 446	Integrated Design II	3		Professional Elective	3
ME 324	Dynamical Systems	3		Economic Elective	3
	Professional Elective	3		Undesignated Elective	3

	Undesignated Elective	3	ES 499	Professional Experience	
Total		15	Total		12

*Students can alternatively take MA 331 and (STAT 383 or STAT 389)

Minors and Concentrations in Engineering

Minor in Architectural and Facilities Engineering

Architectural engineering, also known as building engineering, is an engineering discipline that deals with the technological aspects and multi-disciplinary approach to planning, design, construction, and operation of buildings, such as analysis and integrated design of indoor environmental systems (energy conservation, HVAC, plumbing, lighting, fire protection, acoustics, vertical and horizontal transportation), structural systems, behavior and properties of building components and materials, and construction management. Facilities engineering carries this forward into the operations, maintenance, renovation, upgrade, commissioning, and other aspects of how buildings function throughout their lifecycle. The practice of architectural and facilities engineering is a practice that also involves mechanical, electrical, environmental, and other engineering disciplines as well as building science, energy management, architecture, construction management, and other allied fields. The architectural, engineering, and construction industry is seeking people from a variety of majors in engineering to perform within the space of Architectural and Facilities Engineering.

Required courses	
CE 305	Construction Planning and Management
CE 408	Building Information Modeling & Integrated Project Delivery
CE 409	Fundamentals of Building Systems
CE 448	Introduction to Architectural Engineering
Choose two out of the following elective courses:	
CE 304	Introduction to Scheduling and Estimating
CE 404	Applications in Scheduling and Estimating
CE 410/510	Sustainable Infrastructure and Building
CE 411	Construction Materials Engineering
CE 415/515	Dynamical Systems
CE 441	Reinforced Concrete Design
CE 442	Steel Design
EE 221	Linear Circuits

EE 331	Energy Conversion
EE 333	Power System Engineering
EE/ME 450	Control Systems
EHS 330	Occupational Safety and Ergonomics
ES 238	Introduction to Energy Systems
EV 305	Sustainability & the Environment
ME 310	Thermodynamic System Engineering
ME 411	Introduction to Heat Transfer
ME 444	Computer Aided Engineering
Choose one out of four of the elective courses:	
DS 241	Introduction to Data Science
MA 330	Advanced Engineering Mathematics
STAT 383	Probability and Statistics
STAT 389	Probability and Statistics with Multivariate Analysis
Choose 1 course in art history, architectural history, art appreciation, applied art, or related study (as a knowledge area/university course), 3 credit hours.	
Choose one out of the four elective courses:	
EM/OM 380	Project Management
FN 361	Financial Management
LW 270	Law and Society I
OS 286	Organizational Behavior I
Students must also complete a capstone experience (CE490/491, ME446, EE412, EM456, or equivalent) with an Architectural and/or Facilities focus. Students are also encouraged to seek out alternative multidisciplinary/interdisciplinary capstone options (inclusive of courses related to Clarkson Ignite President's Challenge) to satisfy this requirement.	

Note: these lists are inclusive of their subsequent course formulations, if modified. Courses not listed must be approved by the CEE Department.

Minor in Biomedical Engineering

As various fields of medicine and health care increasingly depend upon advances in technology, graduates who possess combined expertise in engineering principles and knowledge of biological sciences at all levels will be in high demand. The minor in Biomedical Engineering enhances opportunities for Clarkson's students to meet this need, while they graduate with a traditional engineering degree. This minor is connected closely with the minor in Biomedical Science and Technology. Students from both minors participate in shared core courses along with a multidisciplinary capstone design course. **Students can take only one (not both) of the two minors.**

A foundation knowledge of Calculus I & II (MA131/132), Physics I & II (PH131/132), and Biology II: Cell and Molecular Biology (BY160) is required for this minor.

Physiology/ Anatomy Requirement (select one of the following 3 options)	
BY 471/ BY 473	Anatomy and Physiology I Anatomy and Physiology I Lab
BY 472/ BY 474	Anatomy and Physiology II Anatomy and Physiology II Lab
BY 360 BY 362	Comparative Physiology Comparative Physiology Lab
BR 200	Introduction to Biomedical and Rehabilitation Engineering, Science and Technology
BR 450	Biomedical Engineering, Science, and Technology Capstone Design I or equivalent engineering design course with a BEST approved project
BR 400	Biomedical Engineering Fundamentals
Engineering Depth Elective	
Choose 1 from the approved list of upper division biomedical engineering related courses	
Engineering Breadth Elective	
Choose 1 from the approved list of upper division biomedical related course	

Minor in Biomedical Science and Technology
As various fields of medicine and health care increasingly depend upon advances in technology, graduates who possess combined expertise in engineering principles and knowledge of biological sciences at all levels will be in high demand. The minor in Biomedical Science and Technology enhances opportunities for Clarkson's non-engineering students to meet this need. This minor is connected closely with the minor in Biomedical Engineering. Students from both minors participate in shared core courses along with a multidisciplinary capstone design course.

Students can take only one (not both) of the two minors.

A foundation knowledge of Biology II: Cell and Molecular Biology (BY 160) is required for this minor.

Biology Fundamentals requirement (select one of the following 3 options)	
BY 471/ BY 473	Anatomy and Physiology I Anatomy and Physiology I Lab
BY 472/ BY 474	Anatomy and Physiology II Anatomy and Physiology II Lab
BY 360/ BY 362	Comparative Physiology Comparative Physiology Lab
Engineering Fundamentals	
BR 200	Introduction to Biomedical and Rehabilitation Engineering, Science, and Technology
Intersecting BEST Courses	
BR 450	BEST Capstone Design I or equivalent engineering design course with a BEST approved project
Specialty track: choose one track	
Genetic Engineering Track	
BY 214	Genetics
And choose one of:	

BY 412	Molecular Biology Lab
BY/ CM 314	Bioinformatics
Neuroscience Track	
BY/ CM 460	Neurobiology
BY 485	Neural Engineering
PY 458	Cognitive Neuroscience
Breadth Elective	
Choose 1 from approved list of upper division biomedical related course	

Minor in Electrical Engineering

A minor in Electrical Engineering is available to students in any degree program. To obtain the Electrical Engineering minor, a student must complete the four required courses and two of the five elective courses from the following list:

Required courses	
EE 331	Energy Conversion
EE 381	Electromagnetic Fields and Waves
ES 250	Electrical Science
EE 264	Introduction to Digital Design
Choose two out of five of the elective courses:	
EE 221	Linear Circuits
EE 321	Systems and Signal Processing
EE 324	Dynamical Systems
EE 341	Microelectronic circuits
EE 333	Power System Engineering

Courses not on this list must be approved by the ECE Department.

Minor in Engineering Science

The school of engineering offers a minor in Engineering Science for students who satisfy a minimum of 20 credit hours as outlined below:

1. Satisfy prerequisites (MA 131, MA 132, PH 131, PH 132, MA 232, CM 131 or equivalents) for the three core ES courses – ES 220, ES 250, ES 260.
2. Complete the three core ES courses- ES 220, ES 250, ES 260
3. 1 scientific programming course (minimum two credit hours ES 100 or equivalent)
4. 3 engineering electives (minimum nine credit hours – any ES, ME, AE, CE, CH EE courses for which the candidate has the prerequisites, except ES 100, ES110, ES 238, BR 200)

This minor is not open to School of Engineering majors or Engineering & Management majors.

Minor in Environmental Engineering

A minor in Environmental Engineering is available to all students except those majoring in Environmental Engineering. To obtain a minor, a student must successfully earn 18-20 credit hours by completing the following required courses:

Core required courses (2):	
One of the following courses:	
CE 340	Introduction to Environmental Engineering
CE 380	Fundamentals of Environmental Engineering
CH 220	Material Balances
One of the following courses:	
Capstone Design with specific environmental focus (e.g., CE 490/491, MP 401, AE 451, CH 420, EE 412, EM 456, ME 446)	
Environmentally-related research (e.g., CE 495, CE496, ES 443/5/6/7)	
One of the following chemical principles courses:	
CH 210	Molecular Properties
CM 221	Spectroscopy
CM 241	Organic Chemistry I

CM 371	Physical Chemistry I
One of the following biological principles courses:	
BY 214	Genetics
BY 222 and 224	Ecology and Ecology Laboratory
BY 320	Microbiology
BY 330/EV 330	Great Lakes Water Protection
Two of the following courses*: Note: at least ONE course must be a core professional elective	
Core Professional Electives (minimum ONE required):	
ES 432	Risk Analysis
CE 479	Water and Wastewater Treatment Design
CE 481	Hazardous Waste Management Engineering
CE 482	Environmental Systems Analysis Design
CE 486	Industrial Ecology
Other Professional Electives:	
BY 314	Bioinformatics
BY 328	Conservation Biology
BY 412	Molecular Biology Laboratory
BY 425	Biological Systems and Environmental Change
BY 431 & BY 432	Limnology & Limnology Laboratory
BY 486	Molecular Biotechnology
CE 430	Water Resources Engineering II
CE 434	Sustainable Development Engineering
CE 435	Groundwater Hydrology & Geochemistry
CE 477	Atmospheric Chemistry

CE 478	Solid Waste Management and Landfill Design
ES 436	Global Climate Change: Science, Engineering & Policy
EHS 406	Industrial Hygiene Control Methods
EHS 416	Principles of Toxicology and Epidemiology
EV 314	Adirondack Integrated Research Project

*Substitutions made upon approval of the department chair

A minimum grade-point average of 2.0 is required in the courses taken for the minor. At least one quarter of the total credit hours required must be completed at Clarkson, unless the Dean of the Coulter School of Engineering approves an exception.

Minor in Materials Engineering

Many engineers and scientists are employed in the materials processing and manufacturing industries and research labs. Current and emerging areas of infrastructure construction, microelectronics fabrication, polymer processing, biomaterials, and sustainable energy systems, require materials engineering expertise. Clarkson University is offering a Materials Engineering Minor to prepare students for diverse employment opportunities that require knowledge of materials fundamentals and applications. Students seeking the minor must complete 2 required courses and 3 electives from the courses listed below for a minimum of 15 credit hours.

Required courses (2)

ES260 Materials Science and Engineering I
ES360 Materials Science and Engineering II

Electives (3)

Engineering Courses		
Course		***Pre-requisite or co-requisite***
ES222	Strength of Materials	ES220 or permission of the instructor
ES241	Solid-State Materials Systems for Advanced Technologies	PH131, CM103 (or CM131), MA131, and MA132
ES361	Fine Particle Technology	CM104 (or CM132)
ES365	Polymer Materials	CM104 (or CM132)
ES452	Biomaterials and Biomedical Applications	Junior or Senior standing
ES464	Corrosion of Metals	CM132 (or CM104) and ES260

MSE451	Advanced Materials Characterization	**CM132 (or CM104), PH132, and ES260**
CE411	Construction Materials Engineering	Junior or Senior standing
CE453	Properties and Performance of Concrete	ES260
CH441	Introduction of Nanophotonics	PH132 and MA232
CH484	Polymer Engineering	CH330 or ES330 (either can be taken as a co-requisite)
EE341	Microelectronics	ES250
EE439	Dielectrics	none
EE443	Semiconductor Material and Devices for Engineers	Senior standing
AE/ME457	Composite Mechanics and Design	ES222 and ES260
ME390	Advanced Manufacturing Processes	ES260 and ME341
ME457	Composite Mechanics and Design	ES222 and ES260
ME492	Welding Metallurgy	ES260 and ME411
Science Courses		
CM221	Spectroscopy	CM104 (or CM132)
CM430	Colloids and Interfaces	None
CM435	Better Materials through Chemistry	CM241
CM475	Sustainable Nanotechnology	None
CM481	Computational Chemistry	CM371 and CM372
CM483	Introduction to Polymer Science	Junior standing or permission by instructor
CM485	Nanostructured materials	Senior standing or permission by instructor
PH331	Quantum Physics	PH231 and MA232
PH341	Solid State Physics I	PH231, or ES260, or permission by instructor
PH442	Solid State Physics II	PH341 or permission by instructor

PH487	Applications of Synchrotron and Electron Based Techniques	PH132 or consent of the instructor; ES260 and/or PH231 are recommended pre-requisites

*Possible alternative courses include those at the graduate level, such as:

ME506	Mechanical Behavior of Materials	Permission by instructor
ME508	Fracture Mechanics	Permission by instructor

Minor in Sustainable Energy Systems Engineering

Clarkson University offers a minor in Sustainable Energy Systems Engineering to all students who meet the prerequisite requirements. Our reliance on energy-rich sources of fossil fuels has enabled growth of modern society, increasing our mobility, industrial growth, domestic comfort, abundant food supply, and economic prosperity. This fossil fuel combustion though also generates over three-quarters of the worlds' carbon dioxide emissions and contributes to other air pollutants that are harmful to public health. Engineers are among the many types of professionals that need to understand the limits of our present energy systems and lead us to a future in which we can continue to provide reasonable energy resources for human quality of life. This minor emphasizes that all engineering disciplines are necessary to develop and assess technologies to both increase the efficiency of our energy use and advance renewable and alternative energy sources.

A total of 21 credits is required for this minor. Depending upon the student's major, between 9 – 12 hours of this 21 credit total are in addition to the major's core requirements. A student must complete the course requirements as follows:

Required Courses	
ES 238	Introduction to Energy Systems
ES 340/ CH 260	Thermodynamics
AE 451/ CE 490/ CE 491/ CE 492/ CH 482/ CH420/ EE 412/ EM 456/ ME 446/ ES 443 / EE416	Capstone Design (or energy related research) with specific energy focus
One of the following Environmental Impacts Choice Courses:	
CE 486	Industrial Ecology
ES 436	Global Climate Change: Science Engineering and Policy

EV 305	Sustainability and the Environment
One of the following Policy Choice Courses:	
EC 360	Environmental Economics
POL 375	Environmental Law
POL 470	Environmental Policy
POL 471	Energy Policy
PHIL 370	Environmental Ethics
Two of the following Technology Choice Courses (at least one must focus on energy tech):	
CE 409*	Fundamentals of Building Systems
CE 410	Sustainable Infrastructure and Building
CE 486[1]	Industrial Ecology
CH/CM413	Carbon Capture and Sequestration
EE 331*	Energy Conversions
EE 333	Power Systems Engineering
EE 438*	Alternative Energy Systems
ES 436[1]	Global Climate Change: Science, Engineering, and Policy
ES 443*	Energy Technology related research projects
ES459	Electrochemistry for Sustainability
EV 390[2]	Sustainability Project Experience

ME 310*	Thermodynamic System Engineering

*At least one of the two technology choice classes must have this designator
[1]If not taken as an environmental impacts choice
[2]Applicability of this class changes annually

Advanced Manufacturing Engineering (AME) Concentration (Certificate)
The Professional Concentration in Advanced Manufacturing Engineering provides engineering students the opportunity to expand their knowledge of manufacturing-related topics such as production management, statistical quality control, and manufacturing processes. The requirements for the professional concentration in Advanced Manufacturing Engineering are listed in the table below. Interested students may add the concentration to their academic program via myCU. Changes to the Manufacturing Engineering concentration requirements must be approved by the MAE department chair or executive officer. Students successfully completing the following requirements receive a Dean's Certificate in Advanced Manufacturing Engineering.

Required Courses:	
ES 260	Materials Science & Eng. I
ME 390	Additive Mfg. Processes
ME 444	CAD
BUS 2XX or above	Any 200-level or higher School of Business course (with approval of Prof. D.K. Aidun)
Elective Courses (minimum of two required)	
ME 385	Design of Electromechanical Systems
ME 443	Optimal Engineering
ME 492	Welding Metallurgy
ES 360	Materials Science & Eng. II
ES 365	Polymer Materials
ES 464	Corrosion of Metals
AE/CE/CH/EE/ES/ME/ BUS* 3XX or above *BUS: School of Business	Any 300-level or higher Engineering or Business course (with approval of Prof. D.K. Aidun)

Biomolecular Engineering Professional Concentration

A professional concentration in Biomolecular Engineering has been designed for chemical engineering majors who desire a strong background in biochemical engineering and biology. This will benefit students pursuing careers in medicine, biomedical engineering or in the following industries: consumer products, food processing, and pharmaceuticals. The decision to obtain this concentration is made optimally in the sophomore year.

The professional concentration in Biomolecular Engineering offers a chemical engineering major an alternative path for obtaining a BS degree in Chemical Engineering. Students must take BY160 Cellular & Molecular Biology (3 Cr. Hrs.) and BY162 Cellular & Molecular Biology Lab (2 Cr. Hrs.) in spring semester of the sophomore year. BY160 is a requirement for all chemical engineering students; students pursuing the concentration must also take the BY162 laboratory course. The required mathematics elective must be a suitable statistics course (STAT383 Applied Statistics) and technical and engineering electives are replaced with the required courses CM460 Biochemistry I and CH465 Biochemical Engineering. An undesignated elective is replaced with a course selected from the following list of courses relevant to biomolecular engineering: BR200 Introduction to Biomedical Rehabilitation Engineering and Science, BY 214 Genetics, BY 320 Microbiology, BY 360/ 362 Comparative Physiology with Lab, BY 412 Molecular Biology Laboratory, BY 419 Immunobiology, BY 450 Advanced Cell Biology, BY 471/ 473 Anatomy and Physiology I with lab, BY 485 Neural Engineering, CM 453 Intro to Biomaterials, EHS 416 Toxicology, ES 380 Biomechanics or ES 452 Biomaterials and Biomedical Engineering Applications.

Further information on this concentration is available in the Department of Chemical Engineering office. By successfully completing the courses recommended above, upon graduation, students receive a bachelor's degree in Chemical Engineering with a Dean's Certificate indicating a "Professional Concentration in Biomolecular Engineering" and a notation to that effect on their transcript.

Construction Engineering Management Professional Concentration

A professional concentration in Construction Engineering Management (CEM) is available to permit civil engineering majors to focus their electives on courses pertinent to the field of construction engineering and management. Electives used to satisfy the requirements of the concentration include a set of courses that reflect the sub-discipline of Construction Engineering as defined by the Accreditation Board of Engineering and Technology (ABET). The CEM concentration has two tracks: (1) Construction/Infrastructure track for students planning a career in heavy construction management and (2) Architectural Engineering & Building Construction track for students planning a career in sustainable building design and construction management.

To obtain a Professional Concentration in Construction Engineering Management, a student must choose required and professional electives in order to complete the following seven courses:

Construction Engineering Management

Four required courses including:	
CE 411	Construction Materials Engineering
CE 415/ 515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
Choose at least one of the following non-CE courses:	
COMM 217	Introduction to Public Speaking
EHS 330	Occupational Safety and Ergonomics
EM/OM 380	Project Management
EM/OM 451	Quality Management and Lean Enterprise
FN 361	Financial Management
LW 270	Law and Society I
OS 286	Organizational Behavior I
LW 466	The Law of the Workplace

Completion of at least one of these two tracks:	
1. Construction/ Infrastructure Track:	
Choose at least two of the following:	
CE 302	Surveying, Geodetic Control, and Engineering Measurements
CE 304	Introduction to Scheduling and Estimating
CE 315	Geology for Engineers
CE 404	Applications in Scheduling and Estimating
CE 406	Infrastructure Construction
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 410/510	Sustainable Infrastructure and Building
CE 453/553	Properties and Performance of Concrete Materials
CE 461	Transportation Systems Design
2. Architectural Engineering & Building Construction Track	
Choose at least two of the following:Five required courses included:	
CE 304	Introduction to Scheduling and Estimating
CE 404	Applications in Scheduling and Estimating
CE 408	Building Information Modeling (BIM) & Integrated Project Delivery (IPD)
CE 409	Fundamentals of Building Systems
CE 410/510	Sustainable Infrastructure and Building
CE 448	Introduction to Architectural Engineering

Students should meet with their academic advisor to select the most appropriate CEM courses according to their career objectives.

By successfully completing the courses recommended above, upon graduation, students receive a bachelor's degree in their major with a Dean's Certificate indicating a "Professional Concentration in Construction Engineering Management" and a notation to that effect on their transcript.

Electrical Power Engineering Professional Concentration

Clarkson University offers a professional concentration in Electric Power Engineering that is available to electrical engineering majors. The concentration consists of:

1. EE 331 Energy Conversion
2. EE 333 Power System Engineering
3. EE 431 Power Transmission and Distribution
4. 2 power elective courses
5. 1 breadth elective course

Two of the following Power Electives:	
EE 430	High Voltage Techniques and Measurements
EE 439	Dielectrics
EE 438	Alternate Energy Systems
ES 340	Thermodynamics
*Any power engineering graduate course with department approval	
One of the following Breadth Electives:	
EE 450	Control Systems
EE 451	Digital Control
EE 401	Digital Signal Processing
EE 407	Computer Networks
EE 365	Advanced Digital Circuit Design

Courses not on this list must be approved by the ECE Department. By successfully completing the concentration, upon graduation, students receive a BS in Electrical Engineering with a Dean's Certificate indicating a "Professional Concentration in Electric Power Engineering" and a notation to that effect on their transcript.

Structural Engineering Concentration

A professional concentration in Structural Engineering is available to civil engineering students to increase their ability to modernize and increase the effectiveness of the nation's physical infrastructure. This challenge involves the design and construction of new physical systems such as our highways, harbors and waterways, bridges, buildings, and water treatment facilities. This effort requires a variety of specialized talents that can in part be developed through the selection of professional electives.

To obtain a Professional Concentration in Structural Engineering, a student must choose required and professional electives in order to complete the following seven courses:

Structural Engineering

Five required courses including:	
CE 420/520	Computational Methods of Structural Analysis
CE 415/515	Foundations, Stability, and Retaining Structures
CE 441	Reinforced Concrete Design
CE 442	Steel Design
CE 490/491	Senior Design with Structures Focus or approved alternate
Choose at least two of the following:	
CE 408	Building Information Modeling(BIM) and Integrated Project Delivery(IPD)
CE 411	Construction Materials Engineering
CE 445	Timber Design
CE 448	Introduction to Architectural Engineering
CE 452/552	Advanced Strength of Materials
CE 453/553	Properties & Performance of Concrete Materials
CE 501	Fracture Mechanics of Concrete Structures
CE 512	Structural Dynamics

CE 521	Advanced Mechanics of Composite Materials
CE 538	Finite Element Methods
CE 541	Bridge Engineering
CE 549	Experimental Methods in Structures
CE 555	Structural Damage Assessment, Rehabilitation, and Repair

It is of particular importance for transfer students to be aware of the sequence of prerequisite courses required to complete Steel Design and Reinforced Concrete Design for the Structural Engineering concentration. This sequence consists of ES220, ES222, CE320, CE441 (Spring), CE442 (Fall), and requires five semesters if transfer students have not taken ES220 Statics before entering Clarkson. In special circumstances, ES222 and CE320 can be taken concurrently.

By successfully completing the courses recommended above, upon graduation, students receive a bachelor's degree in their major with a Dean's Certificate indicating a "Professional Concentration in Structural Engineering" and a notation to that effect on their transcript.

Water Resources Engineering Concentration
A professional concentration in Water Resources Engineering is available to undergraduate students who are planning a career in hydraulics, open channel flow, water treatment, or hydrology. The professional concentration allows students to satisfy the accreditation requirements in civil engineering while pursuing a course of study in water resources engineering. Students receive a Bachelor of Science degree in CE with a certificate of professional concentration in Water Resources Engineering.

To obtain a Professional Concentration in Water Resources Engineering, a student must choose required and professional electives in order to complete the following seven courses:

Four required courses including:	
CE 430	Water Resources Engineering II
CE 470	River Restoration
CE 479	Water and Wastewater Treatment Design
CE 490/ 491	Senior Design with Water Resources Focus or approved alternate

Choose any two from the following:	
CE 315	Geology for Engineers
CE 340	Introduction to Environmental Engineering
CE 380	Fundamentals of Environmental Engineering
CE 434	Sustainable Development Engineering
CE 435	Groundwater Hydrology and Geochemistry
CE 478	Solid Waste Management and Landfill Design
CE 481/581	Hazardous Waste Management and Engineering
CE 482/582	Environmental Systems Analysis and Design
And choose at least one from the following:	
BY 330/ EV 330	Great Lakes Water Protection
BY 431	Limnology
ES 436	Global Climate Change: Science, Engineering & Policy
COMM 428	Environmental Communication
EV 305	Sustainability & the Environment
PHIL 370	Environmental Ethics
POL 374	Environmental Political Theory
POL 375	Environmental Law
POL 470	Environmental Policy

INSTITUTE FOR A SUSTAINABLE ENVIRONMENT

Susan E. Powers, Director and the Spence Professor in Sustainable Environmental Systems
Alan Rossner, Associate Director for Education
Andrea Ferro, Associate Director for Research

The Clarkson Institute for a Sustainable Environment (ISE) is home to Clarkson's environmental activities associated with research, interdisciplinary graduate and undergraduate degree programs, and outreach programs. The Institute was established to support Clarkson's long-standing expertise in this field and to increase interdisciplinary collaboration among faculty.

The Institute for a Sustainable Environment is a collaborative and multidisciplinary community that serves as the hub for the University's drive toward a sustainable world. We facilitate high impact learning experiences, foster transformative scholarship, and engage the campus and broader community in order to understand and address environmental and sustainability challenges

Recognizing that sustainability problems increasingly require the expertise of many disciplines and points of view, the Institute promotes partnerships and interdisciplinary activities that enable the integration of basic and applied research, providing the increased understanding about environmental and social systems that is needed for informed decisions and policies. Fostering links among its affiliates is facilitated by its activities, including ISE sponsored workshops, seminars, and student co-curricular activities. Faculty and students also participate in ISE's interdisciplinary programs: BS-Environmental Science & Policy, BS-Environmental Health Science; MS-Environmental Policy; MS & PhD Environmental Science and Engineering. Several minors are also available to help students from across campus integrate sustainability and the environment into their disciplinary majors.

BS In Environmental Science & Policy

Alan Rossner, Director

Concerns about environmental issues and how sustainable our natural and human resources will be in the future are increasingly at the forefront of governmental policy, corporate planning, and the day-to-day choices of families like yours. Government-supported research focuses on important topics such as climate change, depletion of the ozone layer, habitat destruction, and air and water pollution. Corporations seek new production methods and materials to decrease industrial pollution. At home, work or school, we can minimize our carbon footprint, reduce our water use and attempt to reduce our solid waste through recycling and purchase products with less packaging.

Cleaning up the pollution of the past and confronting contemporary environmental challenges require creative and multidisciplinary solutions. Those most successful in addressing these complex issues will be trained in a variety of backgrounds. They will understand the basic concepts in the life sciences and their application to real-world problems. They will appreciate the history and complexity of social and political systems. And they will be knowledgeable in environmental regulation and policy. Clarkson's Environmental Science and Policy (ES&P) program prepares its graduates to become effective leaders by providing a broad-based, interdisciplinary background.

Clarkson undergraduates experience hands-on learning that includes assisting the faculty with research projects and working on independent projects. The coursework is challenging but flexible, and the ES&P degree allows students significant freedom in choosing their emphasis in an environmental area. The curriculum is also well suited as a preparatory degree for students interested in pursuing a degree in the health sciences, including medicine, dentistry, and veterinary science.

Programs can be tailored to meet the interests of the student. To this end, Clarkson offers both a minor and a major in Environmental Science & Policy. Upon successful completion of the major, a student will be awarded a Bachelor of Science (BS) degree. The major allows students to pursue their study of the environment in an interdisciplinary fashion.

Program Learning Outcomes

The overarching outcomes for students completing the ES&P program include:

1. Students will be able to explain the basic methods and aims of the environmental science as well as the interactions of organisms, their environments and the consequences of these interactions for human population, communities, and ecosystem dynamics.
2. Students will develop the ability to analyze environmental policy and characterize sustainable communities by becoming aware of scientific issues in the larger social, environmental and economic context.
3. Students will develop skills for lifelong learning and standards of professional behavior that include rules of ethics.
4. Students will develop effective oral and written communication skills with peers and members of the public to be able to communicate the fundamentals of environmental science and policy.
5. Learn about career opportunities in the environmental sciences in preparation for professional employment or graduate school after graduation.

Our learning outcomes were developed with the vision that we will administer an educational experience that motivates students toward academic excellence and provides them with a comprehensive program of study conveying the knowledge, skills, and preparation to excel in the Field of Environmental Science.

There are required courses in biology, ecology, business, chemistry, physics, policy, and mathematics. Using these as a foundation, students can use professional electives to investigate environmentally related issues of interest in more depth.

Course Requirements & Electives

ES&P REQUIRED COURSES

Course	Title	Credits
BY 140	Biology I: Inheritance, Evolution & Diversity	3
BY 142	Biology I: Laboratory	2
BY 160	Biology II: Cell and Molecular Biology 3	3
BY 222	Ecology	3
BY 224	Ecology Lab	2

BY 320	Microbiology	3
CE/SC 301	Global Information Systems	3
CM 131 *OR* **CM 103 & CM 106**	General Chemistry I Structure and Bonding & Chemistry Lab I	4 3 & 2
CM 132 *OR* **CM 104 & CM 106**	General Chemistry II Equilibrium and Dynamics & Chemistry Lab II	4 3 & 2
CM 241	Organic Chemistry I	3
EC 150 (or EC350)	Microeconomics	3
EC 360	Environmental Economics	3
EV 100	Intro to ES&P and EHS Seminar[1]	1
EV 280	Environmental Science	3
EV 305	Sustainability and the Environment	3
FY 100	Freshman Seminar	1
PH 141 *OR* **PH 131**	Physics for Life Sciences I or Physics I	4
PH 142 *OR* **PH 132**	Physics for Life Sciences II or Physics II	
POL 470	Environmental Policy	3
UNIV 190	Clarkson Seminar	3
MA	Two math courses (one must be a calculus course)	6
STAT	One statistics course	3
EHS courses	Must complete 5 credits: EHS 309: Intro to Industrial Hygiene EHS 310: Industrial Hygiene Laboratory	 3 2
EV 400	Capstone Research Project	3
EV 432	Risk Analysis	3
Core Policy	2 core policy electives from a list of 5	6

Env/Sust Courses	2 social science oriented classes with an environmental or sustainability focus	6
Electives	Science/Engineering/Math electives	6

ES&P ELECTIVES

Professional Electives are defined as courses appropriate to the professional and career objectives of students and the ES&P Program. Professional electives are typically upper-level courses (300-level or above) chosen with the advice and consent of the student's advisor, and focused on a minor, concentration or double major (in Biology, Chemistry, Environmental Engineering, Environmental Health Science, Law, or Communication, for example). The following courses are considered professional electives. The Adirondack Semester provides an excellent way to complete many ES&P electives. Additional courses may be taken pending permission from the director of the program. Some professional electives require additional prerequisites. A list of frequently offered electives courses is available in the ISE office. The following list provides an example of common ES&P electives

SCIENCE/ENGINEERING/MATH select 2 (6 credits) total from the following:			
BY 302	Plant Science of Northern New York	**CE481**	Haz. Waste Management
BY 304	Zoology	**CE 486**	Industrial Ecology
BY 322	Microbiology Lab	**CM 242**	Organic Chemistry II
BY 328	Conservation Biology	**CM 244**	Organic Chemistry Lab
BY 340	Behavioral Ecology and Sociobiology	**CM 300**	Instrument lab
BY 358	Animal Learning & Cognition	**CM 371**	Physical Chem I
BY 420	Evolution	**EHS 405**	Methods and Analysis
BY 425	Biological Systems and Environmental Change	**EHS 416**	Principles of Toxicology & Epidemiology
BY 431	Limnology	**EHS 481**	Adv. Topics in Env. & Occ. Health
BY 432	Limnology Lab	**ES 432**	Risk Analysis

BY 450/CM 460	Biochemistry I	**ES 436**	Climate Change: Science, Eng. & Policy
CE 340	Intro to Environ. Engineering	**EV 312**[3]	Adirondack Ecology and Environmental Science
CM 221	Spectroscopy	**EV 316**[3]	Adirondack Env. Science
CM 223	Spectroscopy Lab	**EV/CE 435**	Groundwater/Hydrology
PH 142	Physics for Life Sciences II	**EV 314**[3]	ADK Integrated project
PH 132	Physics II	**STAT 318**	Biostatistics
CE 479	Water and Wastewater treatment		

Core Policy Electives, select 2 (6 credits) from the following:

PHIL 370	Environmental Ethics
POL260	Intro Public Policy
POL 375	Env Law
POL 471	Energy Policy
LW 270	Law and Society 1

Environmental and Sustainability Electives related to Social Sciences select 2 (6 credits) from the following:

ANTH 225	Culture and Environment
ANTH 285	Food and Society or What to Think About What You Eat
BY 330	Great Lakes Water Protection
COMM 428	Env. Communication
EV320[3]	Env & Soc issues in ADKs

EV322[3]	ADK Park: Sense of Place
POL374	Env. Political Theory
PHIL341	Professional Ethics
SOC330	Health, Wealth Inequality and the Environment

[1]Not required for transfer students.
[2] A current list of frequently offered Electives courses is available in ISE office.
[3] Only students accepted in the ADK semester can register for these courses.
[4] Once the student has selected 2 core policy electives, the remaining can also count as Environmental and Sustainability Electives related to Social Sciences.

Complete the University requirements of a minimum of 120 credit hours, knowledge areas, communication points, technology serving humanity course, and the professional experience.

The following is a sample curriculum for ES&P majors. Not all students will complete these courses in sequence shown below.

Environmental Science & Policy Sample Curriculum					
FIRST YEAR					
First Semester			**Second Semester**		
Course	*Title*	*Cr.Hrs.*	*Course*	*Title*	*Cr. Hrs.*
BY 140	Biology I	3	BY 160	Cellular & Molecular Biology	3
BY 142	Biology I Lab	2			
CM 131 or CM 103/105	Gen. Chemistry w/Lab	4	CM 132 or CM 104/106	Gen. Chemistry w/ lab	4
EV 100	Intro to Environ Science & Policy	1		KA Knowledge Area (KA 1)	3
UNIV 190	The Clarkson Seminar	3	MA 181 or 132	Basic Calculus OR Calculus II	3

FY 100	Freshman Seminar				
MA 180 or 131	Intro to College Math OR Calculus I	4			
		17			13
SECOND YEAR					
First Semester			**Second Semester**		
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs.*
BY 222	General Ecology	3	EHS 309	Intro to Industrial Hygiene	3
BY 224	General Ecology Lab	2	EHS 310	Intro to Industrial Hygiene Lab	2
EC 150	Micro Economics[4] (KA 2)	3		Core Policy Elective[1,2]	3
PH 131/141	Physics I OR Physics for LifeSciences I	4	STAT 318/282	Biostatistics or General Statistics	3-4
CM 241	Organic Chemistry	3	PH 132/142	Physics II or Physics for LifeSciences II	4
EV280	Environmental Science	3			
		16			15-16

THIRD YEAR					
First Semester			**Second Semester**		
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs.*
EV 305	Sustainability & the Environment	3	EC 360	Environmental Economics[1] (KA 4)	3
POL 470	Environmental Policy (KA 3)	3		Core Policy Elective	3
CE 301	Geographical Information Systems	3	BY 320	Microbiology	3
	SS-Env/Sust. Elective	3		Free Elective	3
	Free Elective	3		Sci./Eng/Math Elective[3]	3
OR	ADK Semester (Recommended)	15			
		15			15
FOURTH YEAR					
First Semester			**Second Semester**		
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs.*
EV 400	Capstone Project	3	ES 432	Risk Analysis	3
	Sci./Eng./Math Elective[3]	3	EV 401	Capstone Project	1
	Core Policy Elective	3		Free Elective	3
	SS-Env/Sust. Elective	3		Free Elective	3
	Knowledge Area	3		Knowledge Area	3
		15			13

[1]*EC 150 or EC 350 is required as a prerequisite for Environmental Economics (EC 360) and will satisfy a knowledge area requirement.*

NOTE: Some electives may require additional prerequisites. Students must be registered for at least 14 credits to qualify for Dean's List or as a Presidential Scholar.

BS In Environmental Health Science

Alan Rossner, Director

Environmental Health Sciences (EHS) is a multidisciplinary program at Clarkson University focused on the study of how the natural and built environment impacts human health. In this continually evolving field, students study human exposure to chemicals and biological agents, indoor air quality, water quality, air quality assessments in communities downwind of factories or busy highways, hazardous waste site assessment, and environmental sustainability. EHS practitioners anticipate, measure, and control hazardous biological, chemical, and physical agents. EHS specialists work closely with engineers, occupational health physicians, safety specialists, and physical therapists to identify the chemical and physical agents responsible for disease in our living environments, as well as hazard control and management strategies.

The EHS curriculum is rigorous and effectively prepares students to work in the important area of environmental health and safety. In addition, the EHS curriculum is well suited as a preparatory degree for students interested in pursuing a professional degree in health sciences, including physical therapy, medicine, dentistry, and veterinary school. The program in Environmental Health Science stresses a strong background in the basic sciences, specific course work in environmental health and safety, and industrial hygiene experience gained through laboratory exercises in environmental monitoring, field trips, co-op and internships.

The vision of Clarkson University's Environmental Health Science Program is to promote the prevention of illness and injury due to environmental and occupational hazards through education, training, and applied research.

Program Learning Outcomes

The overarching outcomes students achieve in the BS EHS program are:

1. Understand the scientific principles and practical applications of the anticipation, recognition, evaluation and control of health hazards in the workplace and community environment.
2. Application of EHS Management, Risk Management and Risk Communication concepts to resolve workplace and community hazards.
3. Develop the skills to use modern techniques and tools to assess hazards in the practice of EHS.
4. Understand the professional and ethical responsibilities inherent to the EHS professional.
5. Demonstrate an understanding of applicable business and managerial practices in EHS.
6. Understand the scientific principles and practical applications of complementary science and engineering studies.
7. Develop the ability to work effectively in teams with other EHS professionals, scientists, community members, government agencies and/or other stakeholders.
8. Understand the role EHS plays in impacting global solutions to environmental health problems – sustainability concepts.

Course Requirements & Electives

EHS REQUIRED COURSES:

Course	Title	Credits
BY 140	Biology I: Inheritance, Evolution & Diversity	3
BY 142	Biology I: Laboratory	2
BY 160	Biology II: Cell and Molecular Biology 3	3
BY 222	Ecology	3
CM 131 ***OR*** CM 103 & CM 106	General Chemistry I Structure and Bonding & Chemistry Lab I	4 3 & 2
CM 132 ***OR*** CM 104 & CM 106	General Chemistry II Equilibrium and Dynamics & Chemistry Lab II	4 3 & 2
CM	Organic Chemistry I	3

Either CM sequence or BY sequence depending on your concentration.[1]		
CM 221	Spectroscopy	3
CM 223	Spectroscopy Lab	3
OR		
BY 471	Anatomy and physiology I	3
BY 472	Anatomy and physiology II	3
EV 100	Intro to ES&P and EHS Seminar[1]	1
EV 280	Environmental Science	3
FY 100	Freshman Seminar	1
PH 141 or PH 131	Physics for Life Sciences I or Physics I	4
PH 142 or PH 132	Physics for Life Sciences II or Physics II	4
UNIV 190	Clarkson Seminar	3
ES 432	Risk Analysis	3
Two math courses - one must be a calculus course		6
EHS Courses:	21 credits in total	
EHS 309	Intro to Industrial Hygiene	3
EHS 310	Industrial Hygiene Laboratory	2
EHS 330	Occupational Safety and Ergonomics	3
EHS 405 or CE 433 & EHS 408	Monitoring and Analysis Human Exposure Assessment & Human Exposure Assessment Lab	4 3 + 1
EHS 406	Industrial Hygiene Controls	3
EHS 416	Intro to Toxicology and Epidemiology	3
EHS 481	Advanced Topics in Environ. & Occupational Health	3
EV 400	Capstone research project	3

[1]*Not required for transfer students.*

EHS ELECTIVES[2]

Bio/Chem/Eng Electives	6
One statistics course	3
One Engineering course	3

[2] *A list of frequently offered elective courses is available in the ISE Student Handbook*
**Complete the university requirements for knowledge areas, communication points, technology serving humanity course, and the professional experience.*

EHS CONCENTRATION REQUIREMENTS

Environment and Security			
CM 221	Spectroscopy	BY 320	Microbiology I
CM 223	Spectroscopy Lab (2 credits)	BY 322	Microbiology I Lab (2 credits)
EV 400	Capstone Project (3 credit)	EV 401	Capstone Project (1 Credit)
Recommended: Select 2 courses below from SUNY Canton:			
JUST 230	Fundamentals of Homeland Security	JUST 326	Threats to Homeland Security
JUST 420	The Corporate Role in Homeland Security		

Other suitable course Criminal Justice/Homeland security courses can be approved by the Director of the ISE or designee.

Ergonomics			
BR 200	Intro to Biomed Rehab	EHS 330 or EHS 320	Safety Management OR Ergo Course
EV 400/ EV 401	Capstone Project – Ergonomics related		
In addition, students must select at least 2 of the following:			
BY 460	Kinesiology II	BY 471	Anatomy & Physiology I (pre-requisite for BY 472)
ME 380	Special Topics Biomechanics (MA 131 pre-requisite)	BY 472	Anatomy & Physiology II
BY 350	Comparative Anatomy	BY 360	Physiology

Other suitable course Ergonomics related courses can be approved by the Director of EHS or designee.

Industrial Hygiene				
CM 221	Spectroscopy		EHS 330	Safety Management
CM 223	Spectroscopy Lab		EV 400/ 401	Capstone Project

Other suitable course Industrial hygiene or chemistry related courses can be approved by the Director of the EHS program.

The following is a *sample curriculum* for EHS majors. Not all students will complete these courses in sequence shown below.

Environmental Health Science Sample Curriculum					
FIRST YEAR					
First Semester				**Second Semester**	
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs.*
BY 140	Biology I	3	BY 160	Biology II	3
BY 142	Biology I Lab	2			
CM 131	Gen. Chemistry I w/Lab	4	CM 132	Gen Chemistry II w/Lab	4
EV 100	Intro to Environ Science & Policy	1	MA 181 OR 132	Basic Calculus OR Calculus II	3
UNIV 190	The Clarkson Seminar	3	Knowledge Area Course #1		3
FY 100	Freshman Seminar	1	Knowledge area or science elective		3
MA 180 OR 131	Intro to College Math OR Calculus I	3			
		17			15
SECOND YEAR					
First Semester				**Second Semester**	
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs.*
BY 222	General Ecology	3	EHS 309	Intro to Industrial Hygiene	3
PH141	Physics for Life Science	4	EHS 310	Intro to Industrial Hygiene Lab	2
CM 241	Organic Chemistry	3	PH 142	Physics for Life Science II	4
EV 280	Environmental Science	3	BY/CM/Eng	Elective[4]	3
Knowledge Area Course #2		3	BY/CM/Eng	Elective[4]	3
		16			15

THIRD YEAR					
First Semester			Second Semester		
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs*
CM 221	Spectroscopy[1]	3	EHS 330	Safety Analysis	3
CM 223	Spectroscopy[1] Lab	3	STAT 318/282	Biostatistics[3] OR General Statistics	3
EHS 405 or CE 433 & EHS 408	Methods & Analysis Human Exp. Assess. Exp Assess Lab	4 3 1	BY/CM/Eng	Elective[4]	3
EHS 406	Industrial Hygiene	3	Knowledge Area #3		3
Free Elective		3	CE 340	Intro to Env. Eng.[2]	3
		16			15
FOURTH YEAR					
First Semester			Second Semester		
Course	*Title*	*Cr. Hrs.*	*Course*	*Title*	*Cr. Hrs*
BY/CM/Eng	Elective[4]	3	ES 432	Risk Analysis	3
Prof. Elective	Elective -Sci/ Eng/ Math[5]	3	EV 401	Capstone Project	1
EV 400	Capstone Project	3	EHS 481	Advanced Topics in EHS	3
EHS 416	Principles of Toxic & Epidem.	3	Knowledge area Course #5		3
Knowledge Area Course #4		3	Free Elective		3
		15			13

[1]Or suitable Biology/Chemistry/Engineering course depending upon your concentration.
[2]Or other suitable Engineering elective
[3]Or other suitable Statistics course
[4]200 level course or above
[5]300 level course or above

NOTE: Some electives may require additional prerequisites. Students must be registered for at least 14 credits to qualify for Dean's List or as a Presidential Scholar.
*Complete the university requirements for knowledge areas, communication points, technology serving humanity course, and the professional experience.

Minors in Institute for Sustainable Environment

Minor In Environmental Health Science

A minor in Environmental Health Science is available to all students except those majoring in this program. To obtain a minor, a student must successfully complete the following courses:

A.	**Required Courses**	
	EHS309 Introduction to Industrial Hygiene	3
	EHS310 Introduction to Industrial Hygiene Lab	2
	EV280 Environmental Science	3
B.	**Select any two courses**	
	EHS405 Methods & Analysis	4
	EHS406 Industrial Hygiene Control Methods	3
	EHS416 Principles of Toxicology & Epidemiology	3
	EHS330 Occupational Safety and Ergonomics	3
	EHS481 Advanced Topics in Environmental Health	3
	ES432 Risk Analysis	3
	CE433 Human Exposure	3
C.	**Select one of the following or students can substitute in an additional course from the previous Section B.**	
	CE340 Introduction to Environmental Engineering	3
	CE380 Fundamentals of Environmental Engineering	3
	CE481 Hazardous Waste Management Engineering	3
	CE479 Water and Wastewater Treatment Processes	3
	CE477 Atmospheric Chemistry	3
	CM371 Physical Chemistry I	3
	BY320 Microbiology	3
	BY425 Biological Systems and Environmental Change	3
	BY471 Anatomy and Physiology I	4

In addition to the required courses, it is recommended that STAT 282 or STAT 383 or BY 318 be taken as a mathematics elective course for this minor. A minimum grade point average of 2.0 is required in the courses taken for the minor.

Minors In Environmental Science or Environmental Policy

Minors in Environmental Science or Environmental Policy are split between environmental science and environmental policy elective choices. The courses listed here offer examples; substitute courses may be taken to fulfill the minor requirements with permission from the director.

For the Environmental Science Minor:

1. 15 credits of environmental science, nine credits of which must be in the 300 level or higher courses. Courses are selected from Category I. *EV 280 Environmental Science* is required for the science minor
2. Six credits of environmental policy. Courses are selected from Category II.
3. One option from Category III

No more than six (6) credits of the engineering classes can be applied towards an Environmental Science Minor. Note: Please check for pre-requisites for many of these courses.

For the Environmental Policy Minor:

1. 15 credits of environmental policy, nine of which must be in the 300 hundred level or higher courses. Courses are selected from Category II.
2. Six credits of environmental science. Courses are selected from Category I.
3. Three credits spread across the following areas:
   A. An independent research project
   B. An ES&P Multidisciplinary Project Course
   C. One option from Category III.

Category I: Environmental Policy 15 credits of Policy course and 6 credits of Science course			
ANTH255	Culture and the Environment	**PHIL370**	Environmental Ethics
COMM428	Environmental Communication		
COMM429	Full Stack Development		
EC360	Environmental Economics	**POL220**	American Politics
ES436	Global Climate Change: Sci, Eng & Policy	**POL250**	Government and Politics Around the World
EV314	Adirondack Integrated Research Project	**POL260**	Intro to Public Policy
EV/EC315	Entrepreneurship & Econ. Dev. in ADK	**POL371**	Environmental Law
EV322	Adirondack Park	**POL400**	Constitutional Law
EV/SS320	Social & Pol. Issues in the ADK	**POL470**	Environmental Policy
LW270	Law & Society I	**POL471**	Energy Policy
LW466	Law of the Workplace	**SOC330**	Health, Wealth, Inequality & the Environ.
LW471	Law and Society II		
OM451	(EM451) Quality Mgmt and Lean Enterprise		

Category II: Environmental Science
15 credits of Science course and 6 credits of Policy course

BY140	General Biology I	**CE486**	Industrial Ecology
BY160	General Biology II	**CE491**	Senior Design Project
BY222	General Ecology		
BY224	General Ecology Lab	**CM221**	Spectroscopy
BY314	Genetics	**CM223**	Spectroscopy Lab
BY320	Microbiology	**CM371**	Physical Chemistry
BY322	Microbiology Lab	**CM476**	Atmospheric Chemistry
BY328	Conservation Biology	**CE430**	**Water Resources Engrg. II**
BY340	Behavioral Ecology and Sociobiology	**EHS309**	Environ & Occupational Health
BY420	Evolution	**EHS310**	Intro to Industrial Hygiene Lab
BY425	Biological Systems and Environ. Change	**EHS405**	Methods and Analysis
BY431	Limnology	**EHS416**	Principals of Toxicology & Epidemiology
CE301	Geographical Info Systems	**ES432**	Risk Analysis
CE340	Intro to Environmental Engineering	**EV/CE435**	Groundwater
CE380	Fundamentals of Env. Engineering	**BY/EV312**	Adirondack Ecology & Env. Science
CE330	Water Resources Engrg. I	**EV314**	Adirondack Integrated Research Project
CE479	Water & Wastewater Treatment Processing	**EV316**	Adirondack Environmental Science

CE481	Hazardous Waste Management	**BY/EV330**	Great Lakes Water Protection
CE482	Env. Systems Analysis Design		

*No more than 6 credits of engineering classes can be applied towards an environmental science minor.

Category III: Three courses spread across the following areas
(can be projects from classes or specific courses)

Project based courses; pick ONE of the following:

EV100	Intro to Environmental Science & Policy	OR
EV305	Sustainability & the Environment	OR
	Adirondack Semester courses	

*Additional courses may be taken to fulfill the minor requirements with permission from the director.

Minor In Sustainable Solutions For The Developing World

Clarkson's minor in Sustainable Solutions for the Developing World is available to students in any degree program. The minor seeks to employ humanitarian principles toward sustainable solutions that address the conflict that often occurs between economic development and environmental justice predominant in the developing world. A goal of the curriculum is to provide students with the tools to understand issues concerning social justice and sustainability to be used when designing and implementing solutions for the developing world.

To obtain the minor, a student must complete courses in four categories (sustainability, culture, business and technical tools for development) and a project-based global experience. Examples of courses that meet the criteria of each of these categories, as well as the number of required credits within each category are listed below.. The specific courses available in these areas vary from semester to semester. The Director of the minor program can approve alternative courses.

1. The purpose of this category of course work is for students to develop a comprehensive **understanding of sustainability principles**. Select one class (3cr. total):

BY115	Intro to Environmental Sustainability
BY 330	Great Lakes Water Protection
BY 425	Biological systems and Environmental Change
BY 328	Conservation Biology
BY 445	Biological Oceanography
CE 434	Sustainable Development Engineering
CE 486	Industrial Ecology
ES 436	Global Climate Change: Science, Engrg., Policy
EV 305	Sustainability and the Environment
EV 390	Sustainability Project Experience
PHIL 370	Environmental Ethics

2. The purpose of this category of course work is for students to develop an **understanding of the cultural, political, and social character of countries** around the world. Select 2 classes (6 cr. total):

ANTH 201	Introduction to Cultural Anthropology
COMM 428	Environmental Communication
LIT 227	Tales from the Tropics
LIT 250	World Literature
LIT 252	African Literature
LIT 355	Power, Exploitation and Freedom: Postcolonial Literature
POL 250	Government and Politics around the World
POL 251	Introduction to International Politics
POL 335	Violence and Reconciliation
POL 350	Political Economy of Development
POL 351	Globalization
POL 362	Human Rights Law and Politics
SOC 330	Health, Wealth, Inequality, and the Environment

3. The purpose of this category of course work is for the students to develop an **understanding of key principles of innovation and entrepreneurship**. Select two of the following courses (6 cr. total):

COMM 447	Advanced Design Thinking
EC 360	Environmental Economics
EC 370	Economics of Innovation
EM 361	Supply Chain Env. Management
ES 438	Alternative Energy Systems
MK 320	Principles of Marketing
MK 436	Creativity, Innovation & New Product Development
OM/EM 476	Management of Technology
SB 322	Designing and Leading Innovation Ventures
SB 395	Global Business Strategies

4. Students in the minor are expected to engage in a multidisciplinary immersion experience related to the concepts addressed in this minor. Although travel to a developing country is encouraged, there are several approaches to meet this requirement. In all cases, the experience should be approved by the director of the minor in advance and experience be documented for credit toward the minor. Example opportunities include:

- UNIV 299 Global Service (1 credit, requires an additional report to count for SSDW minor)
- UNIV 349 International Service Learning
- UNIV 399 / BY399 Global Experience (with SSDW emphasis)
- A multidisciplinary capstone project course (with SSDW emphasis)
- Non-credit international travel with community service (e.g., with Engineers for International Sustainability, Doctors w/o Borders) (requires an additional report to count for SSDW minor)

The Adirondack Semester

Stephen Bird, Faculty Director

Adirondack Semester

Through the Institute for a Sustainable Environment, Clarkson University offers an off-campus, semester-long study in sustainability via an immersive real-world research problem. The interdisciplinary and community-based program housed at Paul Smith's College, examines the affairs of society and the natural environment of New York's Adirondack State Park. The Park is a living experiment in sustainability where nature, people and policy have come together in the largest protected area in the contiguous United States. Created by New York State in 1892, it is an unusual complex of over six million acres with approximately half of it owned by the citizens of New York State and the other half held privately.

In the ADK semester, a group of 10-14 students are in session with a diverse group of Clarkson faculty with specific interests, experience and scholarly work related to the Adirondack Park and/or the research problem. Students and faculty engage with a professional network of people, businesses and agencies that shape policy, conduct business, and lobby at local and state levels. Students enjoy a classroom learning experience with professors and guest lecturers, which is complemented by scientific and/or policy research in the field.

The semester consists of five, three-credit courses providing the student with 15, 300-level credits. The courses offered each semester vary slightly. Students experience the challenges and rewards of working cooperatively to research, analyze data and to generate answers to these problems. They seek out alternative methods and designs, emerging technologies and provide solutions that are innovative and/or unconventional. Paramount to the cause is a commitment to sustainability for society and nature.

ISE Research

Undergraduate students can participate in a wide variety of interdisciplinary research projects with ISE affiliated faculty who are also associated with departments from across campus. Many undergraduate students participate in ISE related research for credit or pay and present their work at the annual Research and Project Showcase (RAPS). Inquire in the ISE office to learn more about the opportunities that match your interests.

INSTITUTE FOR STEM EDUCATION

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Seema Rivera, Associate Director, srivera@clarkson.edu

The Mission of the Institute for STEM Education (STEM Ed) is

To combine disciplinary rigor with pedagogical science in outreach, teacher training, graduate student and faculty professional development to establish Clarkson University as a national leader in all aspects of STEM Education.

Vision

STEM Ed will:

- Build a reputation of student achievement, exemplary pedagogy, and K12 outreach, STEM Ed will focus on engagement and workforce preparation,
- Support faculty across disciplines and campuses to create learning experiences and curriculum that support all undergraduate and graduate students to be successful beyond Clarkson.
- Deploy Clarkson values of collaborative and innovative STEM teaching and learning to impact undergraduate and graduate student recruitment, retention and education of students from diverse backgrounds and on teacher preparation for K-12 and college-level.

STEM Ed's current objectives include coordination and expansion of Clarkson's STEM Education activities:

1. Expand the TA training "boot camp" both internally and externally and develop an undergraduate TA training module
2. Outreach projects and new grant opportunities coordinated across all three campuses
3. Coordinate student work experiences in educational projects
4. Informal education
5. Academic Retention Programs (First Year Council etc.)
6. Bring the (mostly CRC-based) expertise in academic assessment and evaluation
7. Create and implement programs to support faculty in the classroom and improve learning experiences for Clarkson students
8. Dissemination of Scholarship of Teaching and Learning both on campus and in publications
9. Advise students in the pre-teaching minor

Through all of this, STEM Ed will further enhance Clarkson's reputation on the national and international stage.

INTERDISCIPLINARY PROGRAMS

In recent years, Clarkson University has built on its existing strengths in business, engineering, liberal arts, and the sciences to develop an increasing number of new interdisciplinary majors that combine learning from two or more traditionally distinct areas. Today, many of the most profound advances in knowledge are occurring at the intersections of previously separate academic disciplines and industrial fields. These innovative programs reflect not only the strength of the University's academic faculty and resources, but also the flexibility and vitality of Clarkson's highly collaborative academic environment.

Clarkson's current undergraduate interdisciplinary degree programs are: BS in Engineering and Management, BS in Environmental Health Science, BS in Environmental Science & Policy, BS in Mathematical Economics, BS in Social Documentation Double Major, and BS in Software Engineering, in which there also is a minor.

The BS in Environmental Health Science and the BS in Environmental Science & Policy are housed in the Institute for Sustainable Environment. See the Institute's section of this Catalog for detailed information.

The BS in Engineering and Management is housed in the Reh School of Business. See the Reh School's section of this Catalog for detailed information.

BS In Mathematical Economics

Diego Nocetti Professor of Economics & Financial Studies
Joseph Skufca Professor, Chair of Mathematics

Mathematical economics is the application of advanced mathematical methods to microeconomics and macroeconomics. Students will participate in a rigorous course of study in mathematics, economics, and the interaction between these two disciplines. Students will learn a broad range of economic theories and mathematical techniques that, together, will enable the students to apply rigorous analytical (empirical and/or theoretical) techniques to contemporary issues in economics, finance and beyond. Beyond core classes in each area, students have the freedom to direct their study towards areas of their own interest, including: Economic Theory, Data Analytics, Financial Analysis, and others. Students are able to fulfill the complete set of core Business classes as well, in which case they are well-prepared for managerial careers in the private sector, as well as for the pursuit of graduate education in business, in addition to their expertise in Economics and Mathematics.

Students who choose to major in Mathematical Economics will be able to:

1. Apply advanced mathematical methods to problems in the economic sciences
2. Use statistical and econometric techniques to analyze data related to economic and other phenomena
3. Build and analyze theoretical models which provide guidance in discussions about economic and other policies
4. Critically read the scientific literature in the economic sciences

Students will be prepared for, among other things:

1. Advanced graduate study in the fields of mathematics and/or economics careers in economic policy and consulting
2. Training in the field of actuarial sciences
3. Careers in applied mathematics and statistics
4. Careers as quantitative financial analysts

Students must complete 120 credits in course work including satisfaction of the University General Education and Common Experience Requirements, as well as the major requirements cited below. All course work must be completed in accordance with the academic procedures of the University and the College governing undergraduate scholarship and degrees.

A grade of ‘C-’ or better must be achieved in each MA and EC course applied towards the degree requirements. Students must obtain a grade point average of 2.0 or higher in all MA and EC courses combined.

Mathematics requirements (at least 27 credit hours)	
MA 131	Calculus I
MA 132	Calculus II
MA 200	Introduction to Mathematical Modeling and Software
MA 211	Discrete Mathematics and Proof
MA 231	Calculus III
MA 232	Elementary Differential Equations
MA 339	Applied Linear Algebra
STAT 383	Probability and Statistics
At least one additional MA course numbered above 300	
Economics requirements (at least 24 credit hours)	
EC 150	Principles of Microeconomics
EC 151	Principles of Macroeconomics
EC 357	Intermediate Microeconomics
EC 358	Intermediate Macroeconomics
EC 311	Introduction to Econometrics
EC 313	Mathematical Economics
At least two additional courses with an EC course prefix	
Recommended Courses:	
Recommended MA Electives:	
MA 331	Fourier Series and Boundary Value Problems

MA 332	Intermediate Differential Equations
STAT 381	Probability
STAT 382	Mathematical Statistics
STAT 384	Advanced Applied Statistics
Recommended EC Electives:	
EC 360	Environmental Economics
EC 367	International Economics
EC 370	Economics of Innovation/Entrepreneurship
EC 384	Game Theory and Economic Strategy
EC 451	Industrial and Supply Chain Economics
EC 468	Financial Markets and Institution
EC 475	Personnel Economics

Students who intend to pursue a career in actuarial science or a graduate career in economics are encouraged to take additional mathematics and economic courses. Recommended mathematics courses are any of the above MA courses. Recommended economic courses are any of the above EC courses.

Mathematical Economics Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
EC 150	Principles of Microeconomics	3	EC 151	Principles of Macroeconomics	3
MA 131	Calculus I	3	MA 200	Math Modeling and Software	3
UNIV 190	Clarkson Seminar	3	MA 132	Calculus III	3
FY 100	First Year Seminar	1		Science Course w/lab	3

	Science Course	3		Knowledge Area Elective	3
	Knowledge Area Elective	3			
Total		16	Total		15
Third Semester		**Credits**	**Fourth Semester**		**Credits**
EC 313	Mathematical Economics	3	EC 311	Econometrics	3
MA 231	Calculus III	3	EC 357	Intermediate Microeconomics	3
STAT 383	Probability and Statistics	3	MA 232	Elementary Differential Equations	3
	Free Electives	6		Free Electives	6
Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
EC 358	Intermediate Macroeconomics	3	MA 339	Applied Linear Algebra	3
MA 211	Discrete Mathematics and Proof	3		Economics Elective	3
	Knowledge Area Elective	3		Knowledge Area Elective	3
	Free Electives	6		Free Electives	6
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
MA3xx	Math Elective	3	ECxxx	Econ Elective	3
	Free Electives	12		Free Electives	12
Total		15	Total		15

BS In Social Documentation Double Major

Jason Schmitt,Program Co-director, jscmitt@clarkson.edu 315-268-2314
Jennifer Ball, Program Co-director, jball@clarkson.edu 315-268-4208

Students, whose interests are broad and flexible, with a wide span of interests, should consider Clarkson's double major in Social Documentation (SD), combining majors in the Social Sciences (history, political science, anthropology and sociology) or Humanities (literature, film and philosophy) with a major in Communication & Media.

SD students combine social, political or creative perspectives with mastery of sophisticated communication and recording technologies. They may be interested in historical preservation of the creative arts or creating oral and video histories of people or groups of people; they may be social or political activists who want to create the sound and video recordings and products that most effectively put their ideas before a contemporary audience.

Social Documentation emphasizes critical inquiries into societal issues as well as the study of recording and documenting theories, techniques and technologies. A substantive knowledge base in a social sciences or humanities discipline enables students to ground their communication degree in an area of interest that will also give them a distinctive perspective.

Likewise, the critical thinking, persuasive, and media production skills learned from the communication program will empower the social science or humanities major to more effectively create products that can influence, entertain or educate. During their years at Clarkson, students will develop the ability to use sophisticated recording and communication technologies in order to better understand or advance a set of social, historical, political or creative interests or concerns.

Students choosing this double major will begin with the Clarkson Common Experience, as detailed in the Academic Requirements section of this Catalog. Additionally, they will satisfy all the requirements for each major, as detailed in the School of Arts and Sciences section of this Catalog.

The following additional requirements are specific to Social Documentation, but most will also count as one of the requirements for one of the majors:

1. History of Social Documentation, a three-credit hour gateway course to the major, will introduce basic concepts and stress the connections between the two majors
2. One three-credit hour film course, chosen from a list of approved courses
3. Two three-credit hour video production and digital design courses, chosen from a list of approved courses
4. Two senior capstone courses, SD 480 and SD 490, will generally be taken sequentially
    1. Students enrolled in SD 480 will be folded into that semester's HSS 480 cohort. SD 480 normally involves the research project planning, while SD 490 focuses on execution/ production.

The sample curriculum below indicates some examples of the kinds of courses that might be chosen by Social Documentation double majors, though individuals will personalize their curricula in order to meet their specific educational and career goals.

Social Documentation Sample Curriculum					
First Semester		**Credits**	**Second Semester**		**Credits**
COMM 210	Theory of Rhetoric for Business, Science, and Eng	3	COMM 217	Introduction to Public Speaking	3
MA 180	Intro College Mathematics	4	COMM 310	Mass Media and Society	3
SD 200	History of Social Documentation	3	HIST 391	Documenting Social Activism	3
SS 120	Introducing the Liberal Arts	1	STAT 282	General Statistics	3
FY 100	First Year Seminar	1		Science Course	4
UNIV 190	The Clarkson Seminar	3			
	Science Course	3			
Total		18	Total		16

Third Semester		Credits	Fourth Semester		Credits
ANTH 200	Intro to Culture and Society	3	ANTH 320	Racial Inequity in the US	3
COMM 327	Digital Video Production	3	COMM 3XX	From Communication and Media List	3
HIST 320	Medicine and Society in America	3	COMM 427	Digital Video Production II	3
PY 151	Intro to Psychology	3	FILM 340	World in a Frame	3
				Free Elective	3
Total		12	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
ANTH 385	Food and Society	3	COMM 100	Digital Design	3
POL 351	Globalization	3	COMM 4XX	From Communication and Media List	3
	COMM Electives	6	HIST 395	Voice of the Past	3
	Computer Course	3		Technology Course	3
				Free Elective	3
Total		15	Total		15

Seventh Semester		Credits	Eighth Semester		Credits
SD 480	Research Project and Internship	3	SD 490	Research Project and Internship	3
SOC 350	International Development and Social Changes	3		Free Electives	12
	COMM Elective	3			
	Free Electives	6			
Total		15	Total		15

BS In Software Engineering

Daqing Hou, Program Director
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The discipline of software engineering is concerned with the application of engineering principles to the construction of computer software. It addresses critical issues across the life cycle of a software product, beginning with a proposal to develop an application that requires computing resources for execution, and continuing through the development, testing, operation, and maintenance of the software product until it is retired.

The software engineer plays the role of the architect of a complex system. He or she takes into account the user requirements and needs, feasibility, cost, quality, reliability, safety, security, and time constraints. To do this, the software engineer has to be able to understand the application area that is the target of the desired software system, develop the software and ensure that it is reliable, and manage the project so that it is produced in an economical, timely manner.

Software engineering graduates should be well prepared for a lifetime of professional activity, and the objective of our program is to build a foundation on which graduates can build successful careers. This means that, within a few years after completing the program, we expect that our graduates will be contributing professionals, effective and responsible collaborators. They should also have continued to grow intellectually and as well rounded citizens.

The Program Educational Objectives (PEOs) are:

PEO1: Graduates of the Software Engineering Program are expected to have advanced their careers as contributing professionals in the software industry who apply fundamental software engineering knowledge and analytical problem-solving skills in a wide variety of practical applications.

PEO2: Graduates of the Software Engineering Program are expected to have become well-rounded citizens who rely on their education to serve society with an understanding of their professional and ethical responsibilities.

PEO3: Graduates of the Software Engineering Program are expected to have become effective and responsible collaborators who function well in diverse team environments in the software industry. Some graduates will have emerged as leaders.

PEO4: Graduates of the Software Engineering Program are expected to have exhibited intellectual growth and pursue continual innovation in software engineering. Those graduates who are especially talented and motivated to pursue a graduate degree should be successful at entering and completing graduate studies.

The Student Outcomes (SOs) are:

In order to prepare our graduates to attain these objectives, we have adopted the following student outcomes that we expect our graduates to achieve:

SO1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

SO2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

SO3: an ability to communicate effectively with a range of audiences

SO4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

In the context of the software engineering discipline, this means that graduates of the program will:

1. Have a fundamental understanding of computer systems
2. Be able to apply engineering principles to software design and construction, having developed the ability to:
    a. Develop software requirements and functional specifications
    b. Use proven techniques to design software structure before it is implemented
    c. Apply established verification and validation techniques
    d. Understand the importance of constructing large software systems using standardized components and reusing existing code where possible
    e. Use software tools as effective aids in all phases of software development
    f. Design, develop, and deliver software in a cost effective manner
3. Have experience with issues encountered at every stage in the software life-cycle
4. Understand how to manage the development of software intensive systems
5. Be able to work on an interdisciplinary team of software components of a system
6. Have good interpersonal and communication skills
7. Be able to readily assimilate new technologies
8. Understand the impact their discipline has on society

To accomplish these goals, the curriculum is structured around a group of required courses in science, mathematics, and computer science and engineering. A variety of courses in the engineering sciences are included in the curriculum in order to provide exposure to application areas. Although there is ample opportunity for students to participate in team-based activities throughout the curriculum, each student's program of study includes a major design experience in the senior year in which the student is required to bring together knowledge gained in a wide_variety of courses to solve realistic problems, building significant applications in a team-based environment.

Software Engineering is distinctive at Clarkson because it is interdisciplinary: We combine the expertise, knowledge, and experience of faculty from both the Electrical and Computer Engineering Department and the Computer Science Department. That benefits the students because they master the application of theory as well as knowledge and understanding of software processes as they gain the ability to develop effective and cost-efficient software systems. Clarkson's program is also designed to help students build interpersonal and communication skills that can launch a successful career in today's world.

Requirements for the BS in Software Engineering:

1. Complete at least 120 credit hours of course work with at least a 2.000 GPA, both overall and in the Software Engineering major courses.
2. Complete the course requirements listed in the table below.

Software Engineering Curriculum					
First Semester*		**Credits**	**Second Semester***		**Credits**
CM131	Chemistry I	4	CS141	Intro to Computer Science I	4
PH131	Physics I	4	PH132	Physics II	4
MA131	Calculus I	3	MA132	Calculus II	3
UNIV190	Clarkson Seminar	3	ES110	Engineering & Society, or Equivalent Course[1]	3
FY100	First-Year Seminar	1	ES100	Introduction to Engineering Use of the Computer	2
Total		15			16
Third Semester		**Credits**	**Fourth Semester**		**Credits**
EE 262	Intro to Object Oriented Programming and Software Design	3	EE 221	Linear Circuits/ Science Elective	3
EE 264	Digital Design	3	EE 260	Embedded Systems	3
ES 250	Electrical Science	3	MA 211	Foundations	3
MA 232	Differential Equations	3	MA 231	Calculus III	3
	KA/UC Elective[1]	3		KA/ UC Elective[1]	3

Total		15	Total		15
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
EE 363	Generic Programming and Software Components	3	CS 344	Algorithms and Data Structures	3
EE 407	Computer Networks	3	EE 361	Fundamentals of Software Engineering	3
EE 408	Software Design for Visual Environment	3	EE 368	Software Engineering	3
MA 381/ STAT 383	Probability/ Probability and Statistics	3	EE 462	Software System Architecture	3
	KA/ UC Elective[1]	3	EE 468	Database Systems	3
Total		15	Total		15
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
CS 341	Programming Languages	3	CS 444	Operating Systems	3
EE 418	Senior Design	3	CS 458	Formal Methods for Program Verification	3
	Undesignated Elective	3		Professional Elective [2]	3
ES 499	Professional Experience	0		Undesignated Elective[3]	3
	Professional Elective[2]	3	EE 466	Computer Architecture	3
	KA/ UC Elective[1]	3			
Total		15	Total		15

*This is a typical first- and second-semester curriculum sequence. Not all students will complete these courses in the first year. For example, some students will take ES110 in lieu of PH131 in the first semester, then PH131 in the second semester and PH132 in the third semester.

[1] There are a total of five courses which must be taken to cover at least four Knowledge Areas. At least one of these courses must be a University Course. University courses are interdisciplinary courses that cover two or more knowledge areas. One of the Knowledge Area courses is the required ES110 (or Equivalent). One of the Knowledge Area courses must be an economics course; EC 350 is recommended.

[2] Professional Electives may be any course numbered EE 300+, CS 300+, MS 300+, AS 300+, BR 400, ME 444, COMM 341, COMM 395, or CS 242.

[3] The Undesignated Electives are fulfilled by college level courses that do not contain a significant amount of material already covered elsewhere in the student's program.

See Academic Requirements for details of the Clarkson Common Experience, including the First-Year Seminar, the Clarkson Seminar, Knowledge Area (KA) courses, University Courses (UC), and related requirements and professional experience.

Minor in Robotics

Robotics is an interdisciplinary field that involves the application of mechanical engineering, electrical,
computer and software engineering, and computer science knowledge for the design, construction and operation of automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition. Commercial and Industrial robots are now in widespread use performing jobs more cheaply or with greater accuracy and reliability than humans, or that are too dirty, dangerous or dull to be suitable for humans, e.g., in manufacturing, assembly and packing, transport, earth and space exploration, surgery, weaponry, laboratory research, and the mass production of consumer and industrial goods. The Minor in Robotics is designed to provide students with a solid and coherent introduction to field and consists of two parts: four required core courses (9 credit hours) to give students a strong, working foundation in the associated technology and three elective courses (9 credit hours) that allow students to explore various sub-areas within the field or specialize more deeply in one area.

Requirements
To graduate with a Minor in Robotics, students must earn an average GPA of 2.0 in six courses (18 credit hours) that satisfy the following requirements:

Core Courses (required):

1. MA339- Applied Linear Algebra, 3 credits, Fall/Spring (Prerequisites: MA132; MA230/231), or MA330- Advanced Engineering Mathematics, 3 credits, Fall/Spring (Prereq.: MA231 and MA232)
2. EE455- Introduction to Mobile Robotics, 3 credits, Spring (Prereq.: EE321, EE/ME324, or MA339)
3. EE456- Introduction to Robot Manipulators, 3 credits, Fall (Prereq.: EE321, EE/ME324, or MA339)
4. MP414- Applied Robotics or equivalent robotics project experience, 0 credits (P/NC), Spring/Fall

Elective Courses (minimum of three courses, I.e., nine {9) credits, from the following·):

ECE Department:
EE260 ·Embedded Systems (Prerequisite: CS141) EE401 - Digital Signal Processing (Prerequisites: EE321)
EE408- Software Design for Visual Environments (Prerequisite: EE262)
EE450- Control Systems (Prerequisites : EE324) EE451- Digital Control (Prerequisites: EE321)
EE452 -Optimization Techniques In Engineering (Prerequisites : MA339)
EE465 -Computer Graphics (Prereq.: CS142 or EE262; and MA232 or MA239, or MA339 as a corequisite) EE506- Image Processing and Computer Vision (Prerequisites: EE321)
EE652- Computer Vision (Prerequisites: CS344 and MA339 with minimum 3.5 GPA and junior standing)

MAE Department:
ME385- Design of Electromechanical Systems (Prerequisites: ES250, EE/ME324)
ME443- Optimal Engineering (Prerequisites: ME350 or ME341)
ME444- Computer Aided Engineering (Prerequisites: ES100 or EM121, and MA231)
ME450- Control Systems (Prerequisites: AE/EE/ME324 or Corequisite: EE321)

CS Department:
CS449 - Computational Learning (Prerequisites: CS344 and CS345)
CS451 - Artificial Intelligence (Prerequisite: CS344)
CS452 - Computer Graphics (Prerequisite: CS142 or EE262; and MA232 or MA239, or MA339 as a corequisite)
CS459 - Human-Computer Interaction (Prerequisites: proficiency in C++, Java, or C)
CS461 - Mixed Reality (Prerequisites: CS142 or EE262; and MA232 or MA239, or MA339 as a corequisite)
CS465 - Mobile Robotics/Human-Robot Interaction (Prerequisite: CS344)
CS652 - Computer Vision (Prerequisites: CS344 and MA339 with minimum 3.5 GPA and junior standing)

*Some course substitutions are possible: a list of acceptable substitutions will be maintained by the School of Engineering in conjunction with the MAE, ECE, and CS Departments and updated annually.
In addition, students must satisfy the following University requirements regarding Minors:
A minimum 2.0 grade point average is required in the minor;
Only zero credit hour courses can be designated as pass/no entry;
At least one-fourth of the credit hours required must be completed at Clarkson, unless an exception is approved by the Dean of the minor program.

Minor in Software Engineering

A minor in Software Engineering is available to students in any degree program with the exception of the Software Engineering and Computer Science degree programs. To obtain a minor, a student must complete the following course requirements:

1. CS 141 CS 142, and CS 344 or CS 141, EE 262, and EE 363
2. CS 242 or EE 408
3. EE 368 or CS 350
4. One of EE 465,CS 452, CS 455,EE 407, EE 468,CS 460, or other course approved by the Software Engineering Program Committee

NON-DEGREE GRANTING DEPARTMENTS

Reserve Officers' Training Corps

ROTC at Clarkson University is an elective course of study that provides college-trained officers to the United States Army, Air Force, and Space Force. Upon graduation and successful completion of either the Army program in Military Science or the Air and Space Force program in Air, Space, and Cyberspace Studies, students receive appointments as commissioned officers at the rank of second lieutenant. Each program provides a Basic Course in the freshman and sophomore years, and an Advanced Course in the junior and senior years. Sophomores who did not participate during their first two years may qualify for admission into the Army Advanced Course by attending a special, expenses-paid, four-week basic camp in the summer prior to their junior year. There are other entry options available for veterans and graduate students. Students may enroll in either program's Basic Course without incurring a military service obligation.

Admission to junior and senior (300- and 400-) level classes is contingent upon successful completion of freshman and sophomore curriculum (or its equivalent). In special situations, students may qualify for admission into Army ROTC Advanced Course by meeting other criteria. Non-ROTC students are eligible to enroll in Air Force ROTC 300- and 400-level curriculum with the approval of the instructor. Academic credit toward graduation requirements for Military Science and Air, Space, and Cyberspace Studies courses is determined by the individual schools at Clarkson. Interested individuals should contact the Army ROTC Golden Knights Battalion or Air Force ROTC Detachment 536 direct.

Uniforms and equipment required for ROTC courses are furnished free of charge to students in the Basic and Advanced Courses. Advanced-course students are currently paid a monthly (tax-free) stipend on a 10-month-per-year basis to offset living costs. Additionally, qualified students may be eligible to compete for Army, Air Force, and Space Force ROTC scholarships.

Military Science (Army ROTC)

LTC Tobias R. Clark , Chair & Professor of Military Science, tclark@clarkson.edu 315-268-7630
Mr. Scott Toth, Recruiting and Enrollment Officer, stoth@clarkson.edu 315-268-7695

The Clarkson University Army ROTC Golden Knight Battalion was founded in 1936 to enable Clarkson students to earn commissions as second lieutenants in the United States Army. Since then, it has commissioned over 1,300 leaders into the Active Army, Reserve, and National Guard components. Today, the Golden Knight Battalion continues to commission high-quality officers not only from Clarkson, but also from St. Lawrence University, SUNY Potsdam, and SUNY Canton.

The goal of the department is to develop outstanding scholar-athlete-leaders. The specific training you receive in Army ROTC will teach you leadership development, ethics, military law, training management, communications and fitness. This will take place both in the classroom and hands-on in the field, but you will have a normal daily schedule like all college students.
Army ROTC is an integral part of campus life, and cadets are active in all campus activities, including student government, varsity athletics, and Greek organizations. The battalion is approximately 80 cadets strong, and its focus remains on the development and training of America's future leaders.

The Program

The ROTC program complements the traditional college curriculum by emphasizing development of the student's leadership, management and interpersonal skills through dynamic instruction and challenging, experiential training. This is accomplished through a two-stage curriculum: Army ROTC Basic Course and Advanced Course.

The first stage, or Basic Course, takes place during your first two years in college as elective courses. It involves one elective class and lab each semester. You will learn basic military skills, the fundamentals of leadership and start the groundwork toward becoming an Army leader. You can take Army ROTC Basic Courses without a military commitment.

The second stage, or Advanced Course, takes place during your last two years in college as elective courses. It includes one elective class and lab each semester, plus a summer leadership course. You will learn advanced military tactics and gain experience in team organization, planning and decision-making. Entering the Advanced Course requires a commitment to serve as an Officer in the U.S. Army after you graduate.

Every Army ROTC cadet who enters into the Advanced Course attends Advanced Camp. It is a four-week summer camp that evaluates and develops Army ROTC cadets. This camp takes place between your junior and senior years of college, and is conducted at Fort Knox, Kentucky. Cadets also attend a weekly leadership lab that complements classroom instruction with experiential learning. Leadership labs focus on the practical application of recent instruction. Labs include a leadership reaction course, land navigation, rappelling, small unit tactics, and individual soldier skills. Once each semester, cadets may participate in an extended two-day field training exercise, designed to challenge each cadet's leadership and military skills.

The Golden Knight Battalion also sponsors other events during the year such as a military ball and athletic events. Cadets may also compete to attend the Airborne school, Air Assault school, and Army internships during the summers. After the junior year, cadets may volunteer for summer training internships in locations throughout the United States, Europe and Korea.

After graduation and satisfaction of ROTC requirements, cadets are commissioned as second lieutenants into one of 17 specialized branches in Active Army, Army Reserve or National Guard. There are also opportunities to request to attend Medical School or Law School.

Scholarships

Army ROTC offers a wide range of scholarships for interested and competitive students. Four-, three- and two-year scholarships are awarded to students on a merit basis. Students may apply for four-year scholarships while still in high school, as well as two three-year and four-year scholarships once on campus. These scholarships include:

1. Full tuition and educational fees
2. $1,200 per year for textbooks and classroom supplies
3. $420 per month (tax-free) stipend for up to 10 months per year
4. Clarkson offers all scholarship recipients a Clarkson ROTC Incentive Scholarship to be used to defray the costs of room and board

Scholarship applicants are evaluated on a number of areas that include: SAT/ACT performance, high school or college grade-point average, athletic ability and performance, participation in extracurricular activities, and leadership potential.

Facilities and Equipment

The Golden Knight Battalion has access to special equipment and training facilities that are second to none. On campus, cadets train in a 47-acre area of wooded forest,

containing a rappel tower, land navigation course, and field leadership reaction course. Additionally, students train at Fort Drum, New York, the home of the Army's 10th Mountain Division, located just 60 miles from the Clarkson campus. We utilize the local police range for rifle marksmanship training.

Other Activities

There are many extracurricular activities open to ROTC cadets, including the Ranger Challenge Team, Color Guard, Army 10-Miler Team, Clarkson Guard and Intramural Teams. Some of these groups compete against other universities and ROTC programs in military and athletic competitions. The Cadet Color Guard performs at home hockey games, commissioning and graduation ceremonies, and other official events.

Leadership Training

No other college programs offer leadership training that is comparable to Army ROTC. An Army ROTC student knows how to lead, manage and work with people. Whether you decide on the Army as a career, or use it as a stepping stone to other goals in life, you will have a competitive advantage because you will learn what it takes to lead!

Military Science Curriculum*					
First Semester		**Credits**	**Second Semester**		**Credits**
MS 111	Leadership and Personal Development	1	MS 112	Introduction to Tactical Leadership	1
Third Semester		**Credits**	**Fourth Semester**		**Credits**
MS 221	Innovative Team Leadership	2	MS 222	Foundations of Tactical Leadership	2
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
MS 331	Adaptive Tactical Leadership	3	MS 332	Leadership in Changing Environment	3
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
MS 441	Developing Adaptive Leaders	3	MS 442	Leadership in a Complex World	3

*Courses may be applicable as free electives in some majors where noted. Consult individual departments for details.

If you have any questions or would like to speak with someone about Army ROTC, contact the Golden Knight Battalion at 315-265-2180 or email armyrotc@clarkson.edu.

Air, Space, & Cyberspace Studies (Air Force ROTC)

Lt Col Michelle Baxter, Chair and Professor of Air, Space, and Cyberspace Studies, mbaxter@clarkson.edu

Air Force Reserve Officer Training Corps (AFROTC) combines college study with military leadership, discipline, and training to produce officers and leaders for the United States Air Force and Space Force. Upon graduation with at least a bachelor's degree, students are commissioned as second lieutenants in the active duty Air Force or Space Force. A commission is an appointment as a military officer by the President of the United States.

AFROTC is normally a four-year program divided into two parts, the General Military Course (GMC) for freshmen and sophomores, and the Professional Officer Course (POC) for juniors and seniors. All students also complete a Leadership Laboratory (LLAB) each semester.

General Military Course (GMC)

The GMC involves a one credit hour course and a two-hour Leadership Laboratory each semester. The freshman curriculum introduces the Air Force mission and organization, covers the basics of military customs and courtesies, military correspondence styles, and drill and ceremonies. The sophomore curriculum focuses on providing a fundamental understanding of leadership and team building to include listening, self-assessment, problem solving, and conflict management. Students do not need to be AFROTC cadets to enroll in the academic courses but cannot enroll in the Leadership Laboratory.

Field Training Summer Training

After successful completion of the GMC, cadets are scheduled to attend Field Training during the summer between the sophomore and junior year. Field Training is an intense, two-week, hands-on leadership challenge. Cadets are evaluated on their leadership ability, mastery of military customs and courtesies, and drill and ceremonies. Cadets are exposed to a variety of challenges which forces them to work as a team, critically evaluate situations, and perform under stress. Field Training is often a life-changing experience that builds self-confidence and fine-tunes leadership skills.

Professional Officer Course (POC)

After successfully completing Field Training, cadets are sworn in to the POC and are enlisted in the inactive reserves while they complete their final two years of college. The junior curriculum builds on the leadership and management concepts taught in the

sophomore curriculum focusing on their application within the Department of the Air Force. The senior curriculum continues to emphasize leadership, but introduces national security concepts and issues, cultural awareness, military law, the law of armed conflict, and preparation for entrance into the active duty Air Force. The POC involves a three credit hour course and a two hour Leadership Laboratory (LLAB) each semester. POC cadets are placed in leadership positions and are charged with running the cadet wing. Non-AFROTC students may be eligible to enroll in the academic courses following completion of the GMC, or equivalent, courses. Contact the department for more information.

Leadership Laboratory (LLAB)

LLAB is a hands-on leadership training program. During LLAB, cadets practice the knowledge and skills learned in the academic classes and are instructed in skills they will need for a thriving military career. POC members are responsible for planning and executing LLAB, as well as other extracurricular activities such as formal dinners and awards ceremonies. Cadets are also expected to participate in 2 hours of Physical Training (PT) per week during each semester. Non-AFROTC cadets are not eligible to attend LLAB or PT.

Scholarships

Merit-based tuition scholarships are available to AFROTC cadets but are not required to join the program. Scholarships vary from $18,000 to full tuition. Below is a list of current scholarships:

1. Type I – Full tuition and fees scholarship
2. Type II - $18,000 towards tuition and fees

All scholarships include the following:

1. Free room and board (Clarkson incentive)
2. Monthly Stipend during the academic year
3. Book allowance

For more details, contact the Air, Space, & Cyberspace Studies Department at det536af@clarkson.edu or call (315)268-7989.

Air, Space, and Cyberspace Studies Curriculum*					
First Semester		**Credits**	**Second Semester**		**Credits**
AS101	Heritage and Values I	1	AS102	Heritage and Values II	1
AS103	Leadership Laboratory	0	AS104	Leadership Laboratory	0
Third Semester		**Credits**	**Fourth Semester**		**Credits**
AS201	Team and Leadership Fundamentals I	1	AS202	Team and Leadership Fundamentals II	1
AS203	Leadership Laboratory	0	AS204	Leadership Laboratory	0
Fifth Semester		**Credits**	**Sixth Semester**		**Credits**
AS 301	Leading People and Effective Communication I	3	AS 302	Leading People and Effective Communication II	3
AS303	Leadership Laboratory	0	AS304	Leadership Laboratory	0
Seventh Semester		**Credits**	**Eighth Semester**		**Credits**
AS 401	National Security, Leadership Responsibilities and Commissioning Preparation I	3	AS 402	National Security, Leadership Responsibilities and Commissioning Preparation II	3
AS403	Leadership Laboratory	0	AS404	Leadership Laboratory	0

*Courses may be applicable as free electives in some majors where noted. Consult individual departments for details.

SPONSORED RESEARCH SERVICES

Sponsored Research Services (SRS) is the central office charged with overseeing the conduct and promotion of research activities at Clarkson University. It is the philosophy of the University that research supports and enhances its educational mission. SRS strives to provide and constantly enhance services to the Clarkson community as well as individuals and companies that come in contact with the Division. Examples of such services include proposal development for faculty and staff; administration of grants and contracts established under federal, state, and private awards on behalf of the University; assurance of compliance with federal, state, private, and other regulations pertaining to grant sponsorship activities at the University; and the creation, submission, or provision of analyses, reports or policies as required. Through these activities, SRS promotes innovation and creativity, thereby increasing knowledge and making the knowledge available and useful for scholarship and education.

Clarkson Ignite
Erin Draper, Managing Director
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Ann Barrett, Program Coordinator
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Clarkson Ignite serves the entire campus as an innovation ecosystem that connects students, faculty, staff, alumni, and community leaders to gain critical hands-on creative experience. How? Through shared spaces and programming aimed at stimulating intellectual curiosity, developing entrepreneurial mindsets and skillsets, expanding firsthand learning and making experiences, and forging social and professional connections.

Clarkson Ignite works to instill new ways of thinking and doing in all Clarkson students. The Ignite ecosystem encompasses five key elements: curriculum, extracurricular activities, research, making, and business incubation through the Shipley Center for Innovation. The ecosystem includes the Innovation Hub located in the Andrew S. Schuler Education Resources Center home of group collaboration space, the Makerspace, the Digital Making Suite, and the Studio which is located in Bertrand H. Snell Hall.

ACADEMIC CENTERS

Center for Advanced Materials Processing (CAMP)

A New York State Center for Advanced Technology

Devon A. Shipp, Director
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The Center for Advanced Materials Processing (CAMP) is a Center for Advanced Technology (CAT) funded by New York's Empire State Development Division of Science Technology and Innovation (ESD-NYSTAR).

CAMP's mission is to offer companies, industries and entrepreneurs a vibrant, collaborative, trusted environment in which to engage in focused applied research and technology development activities intended to advance innovation, improve products, solve manufacturing challenges and/or develop new products. CAMP's overarching goal is to contribute significantly to economic growth in New York State. Our main objectives are to:

1. Form collaborative relationships with industry, corporations and entrepreneurs in NYS to assist them in accelerating innovation, discovering and implementing next generation materials, addressing real-world challenges and fostering growth of their businesses.
2. Perform applied research, technology development and technology transfer activities related to the synthesis, processing and design of advanced materials to benefit industry and corporations.
3. Develop the next-generation, high tech workforce by providing excellent education and real-world research/development experiences needed by NY industry and companies.

CAMP relies on faculty and students in four core capability areas:

1. Materials synthesis and functionalization
2. Materials processing
3. Materials-by-design, and
4. Chemical mechanical planarization, underpinned by materials characterization and computational modeling and simulation

CAMP's industry-sponsored research program provides numerous materials science and engineering research opportunities to enrich undergraduate and graduate students' educational experience.

Center for Air and Aquatic Resources Engineering and Sciences (CAARES)

Thomas M. Holsen, Director, tholsen@clarkson.edu
Suresh Dhaniyala, Co-Director, sdhaniya@clarkson.edu

The presence of contaminants in the environment can have a wide variety of negative effects including impacting public health, degrading ecosystems, harming lakes and rivers, and damaging forests and crops. Although, environmental quality has significantly improved over the past 40 years, there are still a number of problems that are attributed to the release of contaminants including the widespread loss of environmental services, climate change, harmful algal blooms, and emerging contaminants including per- and polyfluoroalkyl substances (PFAS). Clarkson University has significant resources in people and equipment that focus on the management of air, water and soil pollution. CAARES is the center that brings together this world-class expertise. CAARES laboratory, office space, and equipment including an aerosol wind tunnel; aerosol sensors, analyzers, and spectrometer; air and water field sampling platforms including Clarkson's 25 foot coastal research vessel, the R.V. Lavinia; and, world class analytical equipment are available for research and education programs at Clarkson. Specific analytical instruments include high-resolution gas and liquid chromatographs, high resolution instruments for trace metals analysis, mercury analytical instrumentation, ion chromatographs and sample preparation instrumentation. Additional information can be found at https://www.clarkson.edu/caares.

Center for Rehabilitation, Engineering, Science, & Technology (CREST)

Charles Robinson, Director
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The Center for Rehabilitation Engineering, Science and Technology was established at Clarkson University in 2005. Its mission is to educate, mentor and train students to be able to integrate and apply a combined scientific, analytic, technological and business approach to emerging biomedical engineering and biomedical science areas. It is of note that biomedical engineering is the most rapidly growing field of engineering, with outstanding biomedical job prospects, and with half of the undergraduates being female, a ratio that exists in no other engineering discipline.

The Center for Rehabilitation Engineering, Science and Technology takes a unique approach to the study of rehabilitation problems. First, through its focus on biomedical engineering, the Center studies how the nervous and skeletal muscle systems of the human body normally work. Secondly, through its rehabilitation science and technology components, it models the mechanisms by which these systems become impaired through disease or injury. Within its rehabilitation technology aspects, the Center investigates how technology can help to restore or replace functions such as hearing, speaking, seeing or moving through the use of artificial assistive or substitutive devices. Through a clinical link with Clarkson's Physical Therapy and Occupational Therapy programs, the Center investigates the outcome of the applications of this assistive technology. The Center also organizes and presents seminars, campus lectures and classroom discussions by visiting leaders in the field of rehabilitation.

Medical and health care have become increasingly technology-based in recent years, with an increased demand for engineers with skills that integrate engineering principles with an understanding of the human physical and psychosocial characteristics. The Center for Rehabilitation Engineering, Science and Technology offers a Minor in Biomedical Engineering to meet this need. Combining a traditional engineering degree with this BmE Minor is an attractive opportunity for engineering students who have a strong desire to use their talents to improve the quality of life for people with medical conditions or disabilities. Clarkson offers this Minor to augment a degree from a traditional engineering department. A similar Minor in Biomedical Science and Technology (BS&T) is available to non-engineers. Both Minors are multi- disciplinary, and will include courses from multiple schools or departments across the University. The Biomedical Engineering Minor is just one of the examples addressing Clarkson's Coulter School of Engineering's motto "Technology Serving Humanity."

Center for Identification Technology Research (CITeR)

Stephanie Schuckers, Director
sschucke@clarkson.edu

Clarkson University is the lead university for an NSF Industry/University Cooperative Research Center, called the Center for Identification Technology Research (CITeR). Other sites include West Virginia University, University at Buffalo, and Michigan State University. CITeR focuses on biometrics, identity, and human analytics https://citer.clarkson.edu/ Over 20 affiliates, including the FBI, DOD, DHS, Qualcomm, Northrop Grumman, and other industrial and government partners, cooperatively define, fund, and execute work to meet common needs. Applications include defense, homeland security, forensics, consumer electronics, financial services, and humanitarian applications.

Research focus areas in identification technology include:

1. Human sensing and acquisition
2. Feature extraction and processing
3. Machine learning and analytics
4. Performance and modeling
5. Multispectral and cross spectral imaging
6. Novel modalities
7. Mobile & computing
8. Social signal processing
9. Authentication & cybersecurity
10. Behavioral and soft biometrics
11. Science of Biometrics

Students are key team members for research projects which are cooperatively defined by industrial and government affiliates. At the completion of their degree, students often go to work for organizations that funded their research project. Educational programs which CITeR researchers pursue include electrical, computer, and software engineering, computer science, mathematics, among others. Additional information is available at https://citer.clarkson.edu/.

Center for Metamaterials

David Crouse, Professor / Chair of Electrical & Computer Engineering
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The Center for Metamaterials (CfM) is an NSF-sponsored Industry/University Cooperative Research Center. The CfM's mission is to provide a collaborative, multi-university one-stop shop to research, design, fabricate and test a wide range of metamaterials, photonic crystals, and plasmonic structures. These structures and materials are nano and micro composite structures that are engineered to control light in unusual ways that are not possible with naturally occurring materials; behavior such as cloaking, channeling and stopping light, and complex light filtering are possible with such structures. Industry interest in metamaterials is growing as these materials are being used to develop new or higher performing optical, electronic and acoustic devices.

Researchers at the Center focus on precompetitive topics jointly identified by the university and industry participants as being of high value, and include fundamental research, metamaterials processing, and device and system development. The CfM projects advance the knowledge base through fundamental and applied metamaterials research and development. The projects involve research teams composed of academic researchers (professors, postdocs, research staff, graduate students and undergraduate students), industry researchers at large and small companies, and researchers from government agencies (e.g., Air Force Research Laboratory (AFRL) and U.S. Army). The intent is to nurture long-term relationships and collaborations among the university, industry, and government laboratories. The intent is also to develop and perform technology transfer of metamaterials-based technologies to the applications of renewable energy, sensing and imaging, antennas, and communication systems. Industry members participating in the Center share in the products of the research and development, the generated intellectual property, have access to laboratories, equipment and expertise, and the resulting economic benefits.

Center for Complex Systems Science

Erik Bollt, W Jon Harrington Professor of Mathematics/Professor of Electrical & Computer Engineering/Director of the Clarkson Center for Complex Systems Science
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Complex systems science involves the study of how many elements develop behaviors that are beyond those behaviors possible by considering the individual elements alone. While the behavior of each individual component of a system in isolation may support intricate dynamics, together the individual components interact to support group behaviors and system dynamics well beyond those possible from individual components alone.

Complex systems science is a rapidly growing and emerging field that is inherently interdisciplinary. It can be applied to a wide variety of fields including biology, medicine and cognitive science, mechanical, chemical, electrical, and civil engineering, physics and astronomy, economics and social sciences. The future of research in these fields lies in understanding not just the isolated components of a given system, but the manner in which the individual components interact to produce “emergent” group behavior.

In contrast to “data mining” or “big data”, where a primary focus is to understand hidden patterns or structure in large data sets, complex systems science attempts to identify “causality” and uncover “universality” that exists in large scale systems. Causality and universality are due to peer and hierarchical interactions, patterns, and scaling of individual system components. Universality has been observed across a wide range of fields such as brain science, insect swarming, social science, and fluid dynamics.

Key to the advancement of complex systems science is the development and use of mathematical tools designed to understand the resultant outcome of group behaviors that are not evident when studying the behavior individual elements alone. Mathematical tools for complex systems science are drawn from the following fields:

1. Information dynamics. The study of interaction of elements and the information flow between elements. Of particular interest is the minimum information needed to produce an outcome of important behaviors
2. Algorithmic complexity. In contrast to information dynamics and entropy of evolving systems is the concept of algorithmic complexity, Kolmogorov complexity, and the concept of minimality of description, as a contrast that intricate behavior is often opposite to simplicity of design
3. Structure and dynamics on networks, as a large number of interacting parts can give rise to behaviors that emerge from the group interactions and not implicit in any one element. Consider that collective behaviors and capabilities of an ant swarm, which is clearly not understood in terms of the behaviors of the parts.

Considering networks brings in the mathematics of graph theory, but well beyond this when understanding dynamics on networks, comes complexity theory.

4. Criticality and scaling, modeling of random networks, the implications of critical phenomena to complexity, and the recent approaches to evolutionary dynamics are all part of this field. As such, understanding interactions from food webs to economies all have a universality that can be understood in terms of the science that includes hierarchical interactions. It is the characterization of such universalities that lead to complex systems as a unifying field across such disciplines
5. Technical details and the tool-sets include areas of dynamical systems and chaos theory, network theory and graph theory, information theory, thermodynamics and statistical mechanics, cellular automate, information theory, activated processes including glasses, fractals, scaling and renormalization

Center for Electric Power Systems

Thomas Ortmeyer, Director
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Electric Power System Engineering is a recognized strength of Clarkson University. The electric power system is undergoing rapid dynamic change due to the development of clean energy sources, the deployment of smart grid technologies, the deregulation of the industry, and the developing growth of the electric vehicle industry. There is a strong need for research, development, and workforce training across the breadth of research areas that focus on electric power systems.

The Center for Electric Power System Research mission is to foster research collaborations across the university, and to grow our power systems research capability. The Center goal is to work closely with industry, and the Industry Advisory Board has an important role in the Center governance.

The center has a strong education mission, at the undergraduate and graduate levels, as well as in programs for practicing professionals. Our undergraduates can select the Electrical Power Engineering Concentration. This concentration is a set of 6 courses that prepare our students for careers in the electric power industry, whether working for electric power utilities, generation and utilization industries, equipment manufacturers, consultants, and government. The large majority of students in the Concentration complete one or more internships in the power industry before graduating.

DIVERSITY, EQUITY, AND INCLUSION OFFICE

Jennifer Ball, Chief Inclusion Office Title VI, IX, ADA/504 Coordinator, Associate Professor of History and Social Documentation/
jball@clarkson.edu

The Diversity, Equity, and Inclusion Office oversees strategic planning for diversity, equity, and inclusion and provides dynamic programs and training for Clarkson's students, faculty, and staff. These include ongoing opportunities to learn with and from our team through a range of methods including speakers, open dialogues, cultural festivities, workshops and more.

The Diversity, Equity, and Inclusion Office oversees several lounges, organizations, and committees at Clarkson. Our team members aim to create and support an inclusive campus community for employees and students. It is our goal to cultivate an environment that educates, empowers, and celebrates all of our students and employees.

Working in partnership with other departments, offices, institutions, and the surrounding community, it is our responsibility to recognize and support the diversity represented on our campus. We believe that continuously advocating for diversity, equity, and inclusion is necessary to achieve academic and institutional success and to prepare our students to be leaders in a diverse world.

STUDENT AFFAIRS

Clarkson Regulations

Each student is responsible for knowing the contents of the Clarkson Regulations. The Regulations contain information on student rights and responsibilities, course policies, academic regulations, academic integrity, student conduct, grievance procedures, and policy statements. For a link to the Clarkson Regulations, please visit: https://www.clarkson.edu/student-administrative-services-sas/clarkson-regulations.

Orientation

Students know that they have been accepted to an academically selective institution, yet the atmosphere at the University is friendly and supportive, one in which students go out of their way to help each other succeed. Our students learn the importance of an individual's contribution to successful teamwork in the completion of any project. This provides the Clarkson student with experience and insight into the significance of developing intellectual and interpersonal skills simultaneously.

Clarkson's concern for new students begins even before they arrive on campus. From acceptance to arrival (for campus-based programs), students will receive relevant information pertaining to their experience, including access to an online platform to ease assimilation prior to matriculation that shares important information before students begin, their first few days, and navigating Clarkson University prior to the first day of class.

Clarkson Housing

Undergraduate students in their first, second, third, and fourth cohort years are required to live in University housing unless they are granted an exemption to the residency requirement. Students living in campus housing are required to contract for food service, eating their meals in a University dining venue of their choice (exceptions are campus apartment residents).

The Residence Life Staff provides supportive and development programming for students. All events and programs are designed to involve and engage students with the campus community and provide a healthy mix of educational, fun, and recreational activities to support the diverse interests of Clarkson students.

University housing provides accommodations ranging from traditional rooms to suites to apartments. Special attention is given to the assigning of roommates to first-year students. Most first-year students reside together in Cubley-Reynolds and Ross-Brooks (otherwise known as "the Quad") on theme-based floors. Students select from a wide variety of themes during the summer prior to arrival. Some of our housing units feature

suite-type accommodations; these are typically two double rooms with interconnecting baths. Lounges and recreational areas, laundry rooms, and vending machines are located in or near each residence facility.

In addition, the University operates three on-campus apartment complexes. All units are furnished with kitchen facilities and include utilities. Students in a campus apartment are not required to contract for food service; however, they may choose to do so. Students residing off campus have the option of contracting for University food service.

Cable TV and data ports are available for students in each room or apartment. Smoking is not permitted in any buildings on campus including the residence halls.

Campus housing is staffed by live-in University employees known as Area Coordinators, who supervise and train students who serve as Resident Advisors (RAs) to assist students with personal issues and a variety of educational, social, and recreational programs.

Fifth-year students are housed on campus only as space allows. Fraternity and sorority members who meet academic requirements may live and dine in University-recognized fraternity and sorority housing. Upper-class fraternity and sorority members living in residence halls may be permitted to take their meals at their respective fraternity or sorority houses. Students are responsible for knowing and adhering to the Residence Regulations enumerated in the University housing contract and on the University's website.

Theme Housing

Clarkson strives to create learning communities by developing innovative theme housing opportunities created around projects or entrepreneurial ventures in which students from various majors live and learn together. In addition, students are encouraged to develop meaningful proposals for living together in theme-related housing, increasing options for students with similar interests to live together while intentionally expanding the collaborative learning atmosphere of our campus residences.

Student Health & Counseling Center (SHAC)

Counseling Services

A Clarkson University education encompasses more than classroom learning. Challenges and transitions provide opportunities for personal, social, and academic growth and cognitive development. Counseling services are confidential and offered at no additional cost to enrolled students. Counseling and health professionals at Student Health and Counseling collaborate to enhance the well-being and health of Clarkson students. Counseling services focus primarily on mental health concerns and problems such as: adjustment to change, relationships, self-care, communication, career-vocational choice, academic performance, identity development, personal/sexual/social behaviors, habit change, depressed mood, stress and anxiety, loss and grieving, sexual harassment and/or assault, gender identity, self-esteem, loneliness, substance use and/or abuse, and self-defeating behaviors.

Office of Accessibility Services

This is the initial point of contact for students with documented disabilities seeking accommodations or services. The office is responsible for maintaining disability-related documentation, certifying eligibility for receipt of services, determining reasonable accommodations, and ensuring the provision of those services. Students are asked to make contact with the Office of Accessibility Services prior to the beginning of each semester at Clarkson in order to ensure that accommodations will be available in a timely fashion. The student will meet with the staff of Accessibility Services to review documentation and determine reasonable accommodations. The Office of Accessibility Services will provide instructions to the student for faculty and staff notifications requesting reasonable accommodations. Reasonable accommodations will be provided to eligible students who have followed the procedures as developed by the Office of Accessibility Services. Services may include short-term arrangements for students who have become temporarily disabled.

Alcohol and Drug Education

Clarkson's alcohol and drug educational efforts are focused on two important messages. The first emphasizes the legal obligations of students with regard to the use of alcohol or any other substance. The University's alcohol and drug policies are stated clearly in the Clarkson Regulations and are guided by law. A civil community is built on respect for others and respect for the law. A second major emphasis is the complicated concept of responsible and moderate use of alcohol. The use of alcohol is interwoven in many everyday settings and activities in our culture. Education and policy at Clarkson are designed to insist on legal and moderate usage among those choosing to drink, and

to discourage dangerous or harmful practices involving alcohol or other substances. Campus programming is designed to convey the messages highlighted above. Students who are interested in participating in prevention efforts can contact the counseling staff on the ground floor of the Educational Resources Center. Students with special concerns or problems with alcohol or drug abuse should also contact Counseling Services at the same location.

Health Services

The University has forged a partnership with Canton-Potsdam Hospital (CPH), in which CPH provides professional staffing and services at the University's Student Health Center. Through this partnership, students enjoy a comprehensive health care program and the broad professional capacities provided by the hospital and its highly trained staff. At the Student Health Center (centrally located in the Educational Resources Center), CPH provides clinical services to include basic medical care, preventative care, general physicals for student-related activities and limited urgent care. Most visits to the Student Health Center and many services are free of charge. The Student Health Center is open weekdays from 8 a.m. – 4:30 p.m. during the academic year. After hours care is also available at CPH's Urgent Care Center (49 Lawrence Ave) or the CPH emergency department (50 Leroy Street) located approximately one mile from campus. In after hours emergency situations, students are encouraged to contact Campus Safety if they need assistance.

CAREER CENTER

The Career Center is a holistic student service that provides connections between students, alumni, and employers as they prepare for their post-graduate career journey. . Our office provides career development and services that include exploration, professional development, experiential education, and employment opportunities. We utilize a holistic comprehensive career readiness educational model that meets students where they are at to help prepare them to make their mark on the globally diverse world.

Fun Facts:

1. 95% of Clarkson graduates who reported are placed in either their field of study, continuing education, or with the military within 6 months of graduation
2. 92% of students participated in an internship, co-op or research to fulfill their professional experience requirement before graduation
3. Over 350 employers visit campus yearly to recruit at Career Fairs and campus interviews
4. All students have access to Handshake, a comprehensive online career resource

Visit and interact with our office early to obtain:

1. A jump start on your career journey- resume, cover letter, interview and networking advice available in one-on-one coaching
2. Targeted student services and resources available to students 24/7 on our website for a customized experience
3. Student professional development through workshops
4. Access to employers and alumni through mock interviews, discovery sessions, hiring events and innovation competitions
5. Assistance with landing internship, co-op, and full-time career experiences

Career and Job Search Services

Individual career coaching appointments are available through the Career Center to discuss topics such as career direction and choice, skills identification (career readiness), employment opportunities, and job search techniques. Staff members are available to help students discern solutions and develop strategies to address career-related concerns.

The Career Center facilitates a wide number of career-oriented workshops for first-year students through graduate-level students, including career exploration groups, resume preparation, interviewing techniques, and job-search techniques. The mock interview program is noted for its success in preparing students for their job interviews. The bi-annual Career Fairs attract hundreds of employers to recruit on campus each year. Among the many benefits of a Clarkson education is the alumni network. Alumni serve as a critical link to the Center. The Center also reaches out to the community by planning programs with any campus organization or academic program.

The Career Center provides access to internship, co-op, and permanent job opportunities through the following means: campus recruiting programs with business, industry, and government; Career Fairs, a Web-based resume database system that enables the Center to provide students' resumes to employers; a job listing and networking service online called Handshake; and a network of thousands of Clarkson alumni who can be tapped at any time in the students' years at the University.

Clarkson's reputation with hundreds of companies across the country, combined with a comprehensive Career Center, has resulted in positive outcomes for the graduates consistently over years.

Experiential Education Program
Cooperative Education & Internships Cooperative Education (Co-op) Program
The Career Center works closely with representatives of business, industry and government to connect students in meaningful real-life work environments during the academic year. A Co-op experience provides students the opportunity to apply their academic knowledge and gain valuable experience while positioning them to obtain full-time professional employment upon graduation.

Typically, students participate in the Co-op Program for an academic semester and a summer. Students may choose to co-op from January through August or from May through December. However, the co-op work block timeframe is very flexible and the University makes every effort to match a student's academic plans with a company's work schedule. To help prepare students for the co-op experience, the Career Center provides skill-based seminars and workshops. The focus of these programs are on writing resumes, cover letters, practicing job interviews, teaching students how to conduct a successful job search, and professionalism in the workplace. A key decision for the student is how to make up coursework missed while in the workplace. Students can choose to attend summer school, use AP credit they have earned, overload coursework during the semester or push back their planned graduation date. Co-op students work closely with their academic advisor, Student Administrative Services representative and the Career Center staff to plan out a successful co-op experience. While away during the semester(s), a co-op student is considered a full-time student and does not pay tuition expenses. All University students are encouraged to consider co-op as a way to enrich their Clarkson education. Co-op positions are located across the country, though most are concentrated in the northeast. While on co-op, students are assigned a direct supervisor, paid a professional salary and are evaluated during their job assignment. Students are also encouraged to communicate with the Career Center while on co-op so that staff may monitor their progress.

Internship Program
As part of the professional experience component, the Career Center also offers assistance in identifying and applying for internships. Students from all academic majors can pursue internships during any summer of their undergraduate or graduate

program, as well as some unique study/internship programs that are offered during the semesters. Similar to the co-op program, internships are offered throughout the year, along with individual advising. Most internships are paid; in some cases, students receive a stipend or receive academic credit.

Internships are available with business and industry across the country; with local, state, and federal government agencies; and with other agencies, non-profits, and educational institutions. Students work closely with the Center and their academic advisors to select an internship that best suits their needs.

ATHLETICS

Scott Smalling, Director of Athletics

Recreation and Intramural Activities

All students are encouraged to participate in intramural and recreational activities. Clarkson's location provides students with a wide array of outdoor sporting opportunities including individual and team challenges. Intramural contests include both regular leagues and weekend tournaments. Recreational activities included both outdoor and indoor activities.

Varsity Sports

The Clarkson Golden Knights compete in 20 intercollegiate varsity sports, at the NCAA Division I level in men's and women's hockey and with the other 18 at the NCAA Division III/USCSA level.

For more information on Clarkson Athletics, visit http://clarksonathletics.com/splash.aspx?id=splash_18

Facilities

The Henry R. Hodge Sports and Recreation Complex is located on the Potsdam campus, adjacent to the residence halls and easily accessible to all students. Facilities include The Deneka Family Fitness Center, Alumni Gymnasium, Schuler Recreation Building (which houses the Stephenson Field House and the Fuller Pool), the Denny Brown Adirondack Lodge, and the Snell Athletic Fields. Additional facilities include Walker Center, Hantz Turf Field, Bagdad Field, Scott Field, Neugold Field, and the Cheel Campus Center, which is home to The Munter Family Climbing Wall, Steven J. Yianoukos Fitness Center and Hockey Arena.

CAMPUS SAFETY AND SECURITY

The Office of Campus Safety & Security consists of a team of people working with the campus community to meet the specialized safety and security needs of the University. Responsibilities include the maintenance of public order, vehicle registration, emergency first aid treatment, issuing I.D. cards, room key distribution, educational programs (including crime prevention and fire safety), and other related programs.

Campus Safety & Security officers are responsible for the enforcement of the rules and regulations of the University. Officers do not have police jurisdiction over public streets, public property, or private property. Arrests and apprehension are referred to the Village Police. Statistics concerning campus safety and campus crime are available upon request from the Office of Campus Safety & Security or can be accessed at http://www.clarkson.edu/campus-safety .

The department's ability to function as an independent agency enables it to preserve the tradition of Clarkson in which security, safety, and adherence to the Code of Student Conduct are both an individual responsibility and a collective behavior. In emergencies, Village Police are called as first-line, back-up support, along with appropriate University officials and the University Emergency Response Team.

CLARKSON ALUMNI ASSOCIATION

The Clarkson Alumni Association was organized on Founder's Day, November 30, 1904, and has existed since that time to benefit both the University and its alumni. The administration of the Association is vested in the Clarkson Alumni Association Leadership Board in partnership with the Alumni Office. The mission of the Clarkson Alumni Association is to engage and empower alumni as partners in the Clarkson community, nurturing their pride in their alma mater and promoting the interests of Clarkson University and its alumni. Alumni are actively involved in identifying and recruiting quality high school students, and assisting the Career Center in providing career opportunities for our graduates. Alumni are also involved in supporting fundraising efforts, mentoring undergraduates, serving as speakers on campus, serving on advisory councils, and providing opportunities to learn the value of being engaged alumni. There are nearly 30 regional chapters located in almost every major U.S. city. These regional chapters host approximately 120 events each year to engage alumni and keep them connected to Clarkson.

INTERNATIONAL CENTER

The International Center is a hub of activity providing the Clarkson community with a multitude of global opportunities – experiences – and advisement.

Go Abroad

One of the best ways to prepare for the global workforce is to immerse yourself in another culture. The International Center provides students with numerous global experiences, such as: traditional semester/year exchange with many universities around the globe – short-term/faculty led programs – or – international internships.

Study Abroad provides an excellent opportunity for undergraduate students to enhance their academic background and prepare for the global marketplace through exposure to another educational system and culture. The primary program open to all students offered by the International Center is the Student Exchange Program. The program is designed for students to spend a semester or a year abroad usually during their junior year. Students go through a competitive application process during the sophomore year to be considered for the program. Clarkson University has articulated exchange agreements with many universities around the world Please see the Clarkson International Center website for a listing of Clarkson's Exchange Partners by Country.

In addition to the semester or year-long exchange opportunities, Clarkson offers students the option to participate in short-term programs or faculty led trips. The short-term programs are 2-3 weeks in duration and are ideal for those students who do not wish to be gone for a full semester or year. Faculty led trips usually occur immediately following the spring semester while enrolled in a course during the spring semester. The International Center works with all disciplines to ensure all students in all majors that require or want a global experience have the opportunity.

Exchange

Financial Policies

Exchange Programs: Students who participate in the Study Abroad/Exchange Program through Clarkson must attend one of our exchange partner universities in order to receive financial aid. During the exchange semester(s) students pay their tuition to Clarkson; there is no tuition paid to the exchange university. Room, board, and other fees are paid directly to the exchange university by the student. The financial assistance package is applied to the participant's account as if that student were attending Clarkson University. Any credit balance may be requested through the Director of Financial Aid in SAS after tuition is applied and all required financial aid documentation (i.e. loan promissory notes, signed summary, etc.) are processed. This credit can be used toward the room, board, and other fees at the exchange partner university. It is an important step in the application process for the student to consult with the Director of Financial Aid in order to understand how their financial assistance package will be applied to the study abroad/exchange experience.

Non-exchange Programs: Should a student decide to attend a non-exchange university, he or she must take a leave of absence from Clarkson for the semester involved. The student should work with the International Center for approval of these non-exchange programs. No tuition is paid to Clarkson and financial assistance may not be utilized.

Academic Policies

Exchange Programs: All courses must be pre-approved through completion of Off-Campus Coursework Permission Forms prior to leaving campus. All credit is transferred back to Clarkson for those courses that students complete satisfactorily. Course credit will be transferred as transfer credit on a pass/fail system. It should be noted that the credit hour and grading system differ from country to country and school to school. Participants should request to have their grades sent to the International Center at Clarkson prior to leaving their exchange program. It may take several weeks after a student returns to receive these grades.

Non-exchange Programs: The student is responsible for assuring that the courses to be taken through the non-exchange program have been pre-approved by the faculty at Clarkson using the Off-Campus Coursework Permission Forms. The International Center will assist these students with any questions regarding passports, visas, and travel, but non-exchange students will not be included in the official study abroad rosters. Course credit will be transferred as transfer credit on a pass/fail system.

Work Abroad

Imagine working for an organization or company abroad, and learning what it is like to work in another culture. You will increase your marketability and be better prepared for the global workplace upon graduation. Students interested in an internship abroad can work with the International Center staff to identify the opportunities available across the globe. Some of these jobs are paid and some are for academic credit. Visit the International Center website for more information.

International Student and Scholar Services

This part of the International Center informs and educates the international population as well as the University community on immigration regulations that govern international students, scholars and the University. In addition, International Center staff coordinates services and benefits available to the international population and facilitates international cultural events within the Clarkson community to promote global diversity.

INFORMATION TECHNOLOGY

Joshua Fiske, Chief Information Officer, jfiske@clarkson.edu 315-268-6718

Clarkson University is wholly committed to providing high-quality computer resources, services and support to meet the diverse needs of its students and faculty. The mission of the Office of Information Technology (OIT) is to provide access to teaching, learning, research, administrative and communication technologies through a commitment to excellence in customer support and technical leadership in fulfillment of the institutional mission. This involves leveraging the University's corporate partnerships to provide high-performance hardware and software, while employing a distributed user support structure. As a result, Clarkson students receive access to up-to-date technology, backed by direct assistance from easily accessible and highly skilled OIT support staff.

Access to campus IT resources is provided by a high-speed, fiber-optic network "backbone" connecting University classrooms, laboratories, on-campus housing, and faculty offices. Students are able to connect to this network via high-speed wired and wireless connections in buildings across campus. The campus network is connected to the Internet via several multi-gigabit connections.

All students have access to a broad range of computing and information technology resources, including: high-tech, multimedia classrooms and collaborative spaces; email; web conferencing; digital publishing; online teaching and learning; and campus computer labs equipped with the latest software.

OIT supports Clarkson's commitment to integrating technology into the classroom through its instructional technology operation. Instructional Technology supports both students and faculty by providing and maintaining software, equipment and facilities for the production, dissemination, and utilization of learning resource materials.

Student Personal Computers

Information technology is such an integral part of today's marketplace, it is strongly recommended that every Clarkson student have an appropriate personal computer. High-speed network access is available for all students residing on campus. In addition, students can also access the network at any one of the numerous computer labs found in the academic buildings.

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MANIERRE, Matt
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MA, Ph, University of Delaware
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MARKO, Moshe
BPT, University of Tel-Aviv, Israel
MHS, Washington University
DPT, Massachusetts General Hospital Institute of Health Professions
PhD, Syracuse University
Assistant Professor of Physical Therapy

MARTIN, Jonathan
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PhD, University of Alberta
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Clinical Assistant Professor of Physician Assistant Studies

MCCAFFREY, Lewis
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MS, Imperial College
PhD, University of the Wirwatersrand
Visiting Assistant Professor Institute for a Sustainable Environment

MCCRUM, Ian T
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PhD, The Pennsylvania State University
Assistant Professor of Chemical and Biomolecular Engineering

MELNIKOV, Dmitriy
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PhD, Lehigh University
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MERRETT, Craig
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Assistant Professor of Mechanical and Aeronautical Engineering

METTE, Jehu
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MA, PhD, University of Oklahoma
Assistant Professor of History

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TANKSALE, Ajinkya
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MS, University of Pune, Maharashtra, India
BS, Shivaji University, Maharashtra, India
Assistant Professor of Engineering & Management

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Assistant Professor of Physics

THOMAS, Robert
Assistant Professor of Civil and Environmental Engineering

TOTH, Scott
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TOWLER, Christopher
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Clinical Assistant Professor of Physical Therapy

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MA, PhD, University of Rochester
Assistant Professor of Physics

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MS, Missouri University of Science and Technology
Assistant Professor Military Science

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MPAS, University of Nebraska
DHSc, A.T. Still University
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Doctoral, Louisiana State University
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MA, PhD, University of Wisconsin-Madison
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Assistant Professor of Civil and Environmental Engineering

XU, Bin
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PhD, University of Utah, Salt Lake City
Assistant Professor of Mathematics

YANG, Yang
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YOO, Michelle Mijeong
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PhD University of Florida
Assistant Professor of Biology

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ZHANG, Jianhua
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PhD, North Carolina State University
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MS, Jilin University, China
PhD, Syracuse University
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ZHANG, Yuan
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MS, University of California San Diego
PhD, University of Texas at Arlington
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BROOKSBY, Evan
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BS, Brighmam Young University
Instructor, Healthcare Management

BUCKINGHAM, Ronald
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CHAPMAN, Edward
Senior Military Instructor of Military Science

CHAPMAN, Elisabeth
Instructor of School of Engineering

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MS, Clarkson University
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CONLON, Tyler
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Infrastructure, Data Analytics

DEUEL, Ryan
BA, Gardner-Webb University
MA, Kent State University
Ph.D., McGill University
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Communication, Media & Design

GUO, Zhujin
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Environmental Engineering

HOPKINS, John
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Humanities and Social Sciences

HUDAK, Bryan
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Humanities and Social Sciences

ISSEN, Marshall
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MS, Roosevelt University
P.E., Illinois
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JOHNS, Danielle
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MFA, Rochester Institute of
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BA/BS, SUNY Potsdam
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PhD, University of Florida

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Beacon Institute

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Clinical Instructor of Physical Therapy

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MS, SUNY Albany
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Adjunct Instructor Humanities and Social Sciences

TIGHE, Michael
Assistant Instructor of Biology

TIRION, Monique
Adjunct Research Associate Professor

TITUS, Leo
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WANG, Modi
BS, PhD, Hong Kong Baptist University
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WELLS, David John
BS, MS, PhD, Clarkson University
PE, Wyoming (active)
Dean Emeritus- SUNY Canton
Adjunct Professor, MAE Department

WIGGINS, Arderrick
Instructor of Military Science

WULTSCH, Elisabeth
Instructor of School of Engineering

POLICIES

Clarkson University Non-Discrimination Policy

Clarkson University does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, gender expression, national or ethnic origin, age, disability, veteran status, predisposing genetic characteristics, domestic violence victim status, marital status, parental status, ancestry, source of income, or other classes protected by law in provision of educational opportunity or employment opportunities.

Clarkson University does not discriminate on the basis of sex or disability in its educational programs and activities, pursuant to the requirements of Title IX of the Educational Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973, and the American Disabilities Act of 1990 respectively. This policy extends to both employment by and admission to the University.

Inquiries concerning Section 504, and the Americans with Disabilities Act of 1990 should be directed to ADA504@clarkson.edu.

Inquiries concerning Title IX, the Age Discrimination Act, or other discrimination concerns should be directed to Chief Inclusion Officer/Title VI and IX Coordination/ADA and 504 Coordinator Jen Ball at jball@clarkson.edu , ERC 1003A, or 315-268-4208.

Information on the processing of grievances and charges relating to the above policies can be obtained from the Chief Inclusion Office.

Clarkson University is making a special effort to identify employment opportunities and participation in its educational programs a broad spectrum of candidates including women, minorities, and people with disabilities.

Student Complaint Process (HEOA)

In compliance with the Higher Education Opportunity Act of 2008 and the state complaint processes as prescribed for under 34 CFR 600.0, the following resources are provided: Filing a Grievance with NY State New York State

Education Department Office of College and University Evaluation EBA Room 969 89 Washington Avenue, Albany, New York, 12234.

For more information, please visit:
http://www.nysed.gov/college-university-evaluation/filing-complaint-about-college-oruniversity

Campus Crime Statistics
The Advisory Committee on Campus Safety will provide upon request all campus crime statistics as reported to the United States Department of Education. Contact the Director of Campus Safety and Security, 315-268-6666, or visit www.clarkson.edu/campussafety.

Protection of Privacy
Clarkson University abides by the provisions of the Family Educational Rights and Privacy Act of 1974 (Buckley Amendment). The University will release or withhold information under these provisions, which are published annually in the Clarkson Regulations.

Nonimmigrant Students
Clarkson is authorized under federal law to enroll nonimmigrant students.

Student Regulations
Each student is responsible for knowing the contents of the Clarkson Regulations. The Regulations contain information on registration, class absences, the grading system, scholastic requirements, the method for removing course deficiencies, special examinations, and the Code of Student Conduct, campus policies, and other information regarding University operations. For a link to the Clarkson student regulations, please visit:
https://www.clarkson.edu/student-administrative-servicessas/clarkson-regulations

ACADEMIC CALENDAR

The academic calendar contains the dates of major academic events occurring each academic year and serves as an information source and planning tool for students, faculty, staff, families, and outside organizations. The academic calendar is published once a year, and is subject to change at any time.

Undergraduate Programs

	2022-2023	2023-2024
Fall Semester Events	**Fall 2022**	**Fall 2023**
New Student Move-in*	25-26 August	24-25 August
Returning Student Move-In*	28 August	27 August
Classes Begin	29 August	28 August
Career Fair	13-15 September	TBD
Fall Recess	8-11 October	7-10 October
Classes Resume & Midterm grades due	12 October	11 October
Family Weekend Begins	21-22 October	TBD October
Enrollment For Spring Classes Begin	9 November	8 November
Thanksgiving Recess	23-27 Nov	22-26 Nov
Classes Resume	28 November	27 November
Last Day of Class	9 December	8 December
Final Exams	12-16 Dec	11-15 Dec
Fall Graduates Recognition Ceremony	17 December	16 December
Final Grades Due at 9:00am	19 December	18 December

	2022-2023	2023-2024
Spring Semester Events	**Spring 2023**	**Spring 2024**
New Student Move-In	10 January	9 January
Returning Student Move-In	11 January	10 January
Classes Begin	12 January	11 January
Career Fair	7-9 February	TBD
February Break	23-26 February	22-25 February
Classes Resume	27 February	26 February
Midterm Grades Due	3 March	8 March
Spring Recess	11-19 March	16-24 March
Classes Resume	20 March	25 March
Enrollment For Fall Classes Begin	5 April	3 April
Last Day of Class	28 April	26 April
Reading Days	1-2 May	29-30 April
Final Exams	3-9 May	1-7 May
Final Grades Due at 9:00am	12 May	10 May
Undergraduate Commencement Ceremony	13 May	11 May

Summer Semester Events	2022-2023	2023-2024
10 Week Session	**Summer 2023**	**Summer 2024**
Classes Begin	22 May	27 May
Classes End	5 August	3 August
Grades Due	8 August	6 August
First 5 Week Session	**Summer 2023**	**Summer 2024**
Classes Begin	22 May	27 May
Classes End	24 June	28 June
Grades Due	27 June	2 July
Second 5 Week Session	**Summer 2023**	**Summer 2024**
Classes Begin	3 July	1 July
Classes End	5 August	3 August
Grades Due	8 August	6 August
Alumni Reunion	13-16 July	TBD July

LIST OF DEGREE PROGRAMS & HEGIS CODES

The number following the degree program is the Higher Education General Information Survey (HEGIS) code for classifying academic areas designated by the New York State Education Department. Enrollment in other than registered or otherwise approved programs may jeopardize a student's eligibility for certain student aid awards.

Undergraduate Degree Programs

David D. Reh School of Business Bachelor of Science	
Program	**Hegis Code**
Business Intelligence and Data Analytics	0599
Engineering and Management	4904
Financial Information and Analysis	0504
Global Supply Chain Management	0509
Innovation and Entrepreneurship	0506
Wallace H. Coulter School of Engineering Bachelor of Science	
Aeronautical Engineering	0902
Chemical Engineering	0906
Civil Engineering	0908
Computer Engineering	0999
Electrical Engineering	0909
Environmental Engineering	0922
Mechanical Engineering	0910
School of Arts and Sciences Bachelor of Science	
American Studies	0313
Applied Mathematics and Statistics	1703
Biology	0401
Biomolecular Science	0499
Chemistry	1905

Communication	0601
Computer Science	0701
Data Science	1703
Digital Arts and Sciences	0605
History	2205
Literature	1501
Interdisciplinary Liberal Studies	4901
Interdisciplinary Social Sciences	2201
Physics	1902
Political Science	2207
Psychology	2001

Institute for a Sustainable Environment Bachelor of Science	
Environmental Science and Policy	0420
Environmental Health Science	0426
Interdisciplinary Bachelor of Science	
Mathematical Economics	2204
Software Engineering	0999
(See ISE for additional Programs)	
Bachelor of Professional Studies	
Individually Designed Program	4999