SCHOOL OF SCIENCE AND ENGINEERING

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Mission Statement
The mission of the Tulane University School of Science and Engineering is to provide outstanding opportunities for learning and discovery in science and engineering and to foster an environment that is student focused, research intensive, trans-disciplinary, entrepreneurial, and responsive to the needs of society and the community.

Programs of Study
The School of Science and Engineering offers three degrees at the undergraduate level, the Bachelor of Science in Engineering (B.S.E.), the Bachelor of Science (B.S.) and the Bachelor of Arts (B.A.); and two graduate degrees, the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.). Students seeking an undergraduate degree from the School of Science and Engineering must have a primary major offered by the school. Students may have an additional major or minor in a second program. However, special programs such as teacher certification and ROTC are not major or minor programs and are undertaken in addition to a major program. To qualify for graduation, an undergraduate student must satisfy the requirements of the Newcomb Tulane College core curriculum, the school specific core, and the major program and meet the residency and quality of work requirements of Newcomb-Tulane College. To qualify for graduation, a graduate student must meet the graduate program requirements.

Degrees
The School of Science and Engineering offers the Bachelor of Science in Engineering (B.S.E.) degree in the following programs: Biomedical Engineering, Chemical Engineering, and Engineering Physics. The School of Science and Engineering offers the Bachelor of Science (B.S.) degree in the following programs: Biological Chemistry, Cell and Molecular Biology, Chemistry, Ecology and Evolutionary Biology, Environmental Biology, Environmental Science, Geology, Mathematics, Neuroscience, Physics, and Psychology. The School offers the Bachelor of Science degree (B.S.) in Computer Science as a Coordinate Major with any other stand-alone major offered by Newcomb-Tulane College. The School offers the Bachelor of Arts degree (B.A.) in Psychology and Early Childhood Development. The School offers graduate-level certificates in Geographic Information Systems (GIS), Health Psychology, and River Science and Engineering. The School offers the Master of Science (M.S.) degree in the following programs: Behavioral Health (4+1 only); Biomedical Engineering, Cell and Molecular Biology, Chemical and Biomolecular Engineering, Computational Science, Earth and Environmental Sciences, Ecology and Evolutionary Biology, Interdisciplinary, Materials Science and Engineering, Mathematics, Neuroscience, Physics (4+1 only), and Psychology (4+1 only); and Statistics. The School offers the Doctor of Philosophy (Ph.D.) degree in the following programs: Bioinnovation, Biomedical Engineering, Cell and Molecular Biology, Chemical and Biomolecular Engineering, Chemistry, Earth and Environmental Sciences, Ecology and Evolutionary Biology, Interdisciplinary, Materials Engineering and Physics, Mathematics, Neuroscience, Physics, and Psychology.

Undergraduate Degree Programs
School Specific Core Curriculum
Students seeking the B.A. should complete all the degree requirements as described in the School of Liberal Arts section. Students seeking a B.S. should satisfy all core requirements as outlined in the Newcomb-Tulane College section and meet the school-specific and major requirements in this section. Students seeking a B.S.E. should satisfy all core requirements except that of Foreign Language as outlined in the Newcomb-Tulane College section and meet the school-specific and major requirements in this section.
Mathematics and Science
Candidates for the B.S. and B.S.E. degrees in the School of Science and Engineering must take a minimum of 32 credits of science and mathematics selected from at least two different disciplines: cell and molecular biology, chemistry, ecology and evolutionary biology, earth and environmental sciences, mathematics, neuroscience, physics and psychology. At least one of these courses must include a laboratory.

A minimum of six credits of mathematics is required. Any two Mathematics courses numbered 1210 and above may be used to satisfy this requirement. However the combination of MATH 1150 Long Calculus I (3 c.h.) and MATH 1160 Long Calculus II (3 c.h.) may count as one course toward this requirement. Students may satisfy all, or part, of the requirement with the appropriate AP score(s). A score of 4 or 5 on the Advanced Placement AB Calculus exam earns credit for MATH 1210 Calculus I (4 c.h.). A score of 3 on the BC Calculus exam together with a score of 4 or 5 on the AB subsection of the BC exam earns credit for MATH 1210 Calculus I (4 c.h.). A score of 4 or 5 on the BC exam earns credit for MATH 1210 Calculus I (4 c.h.) and MATH 1220 Calculus II (4 c.h.).

Departments may recommend, or require, particular mathematics or science courses for their majors, and students are advised to consult the major department’s listing in this catalog.

Candidates for the B.A. degree (Psychology and Early Childhood Education) follow the School of Liberal Arts Core.

Writing Intensive/Writing Skills Requirement
For students who matriculated fall 2018 or later: Students should satisfy the Writing Skills core requirements as outlined in the Newcomb-Tulane College section. Students may satisfy the Tier 2 requirement within the School of Science and Engineering by taking one course designated “writing-intensive” in the course schedule.

For students who matriculated prior to the fall 2018 semester: Students may satisfy this requirement by taking one course designated as “writing-intensive” in the course schedule. Alternatively, with the approval of the instructor and the Associate Dean for Undergraduate Programs of the School of Science and Engineering, a student may take a course that does not carry the "writing intensive" designation but that fits the criteria of the requirement. The student should submit a petition to the Associate Dean and, upon approval, will be added to a writing intensive course, SCEN 3880 Writing Intensive (0 c.h.). Completion of the first-year writing competency requirement is a prerequisite to enrollment in a writing intensive course.

Additional Requirements for Engineering Majors
Students majoring in biomedical engineering, chemical engineering, and engineering physics must take an additional six credits (for a total of 18 credits) of humanities, fine arts, and social sciences. A student enrolled in the School of Science and Engineering must select a major offered by the school no later than the beginning of a student’s fourth semester of college study.

Undergraduate Special Programs
Second Majors and Minors
Students in the School of Science and Engineering may elect to complete a second major. They must complete all courses for each major and a total of at least 18 different courses in the two majors. At least half of the coursework required for majors must be completed at Tulane University and students must have a grade point average of at least 2.000 in all coursework applied to the major. Students who satisfy the requirements for two majors in the School of Science and Engineering will receive one bachelor’s degree, and their transcript will reflect that a double major has been completed. Second majors from an outside division are subject to the conditions set by requirements for that major as designated by the home division or department. Science and engineering students also may pursue one or two minors. The minor is intended to give structure to the study of a secondary field of interest chosen by the student. Students must complete at least 24 credits in their major that do not overlap with the minor. Students who elect to complete the requirements for a minor must earn a grade-point average of at least 2.000 in courses counting toward that minor. No courses counting toward the student’s first minor will count toward the student’s second minor. Individual departments may have additional restrictions on major-minor overlap. Students should consult the department listings for additional information.

Internships for Academic Credit
Some departments offer internships for academic credit as part of the major. An internship combines a relevant academic component with experiential learning. The academic component may, for example, consist of a term paper, a number of short papers, or discussions of a number of books. Internships ordinarily are open only to those students completing a major in the department that will award the credit. Students participating in internships register for Internship Studies (course numbers vary) within the appropriate department after having made initial arrangements with a professor who will sponsor the internship.

Registration is completed in the academic department sponsoring the internship. A student may not take a salaried position outside the university while earning credit for an internship, except where such an arrangement is required by the cooperating organization for insurance purposes. If a student must take a salaried position for this reason, a letter to this effect from the cooperating organization must be filed with the chair of the sponsoring department prior to the end of the add period. Only one internship may be completed each semester. Students may earn a maximum of six credits for internships. Internships are graded satisfactory/unsatisfactory (S/U) unless they are housed in the Center for Public Service (CPS). The sponsoring professor will assign a grade for the internship at the close of the semester after evaluating its academic and experiential aspects. Internships offered through Science and Engineering departments are open only to juniors and seniors in good standing.

An alternative internship experience is offered to students through Newcomb-Tulane College. This internship was created to accommodate students seeking internships with organizations which require that interns earn credit for their experience. INTR 1990 LAS Internship (1 c.h.) carries one credit, which will apply toward the degree but will not apply toward any core curriculum, major, or minor requirement. Only one credit of INTR 1990 LAS
Internship (1 c.h.) may be applied toward the degree. INTR 1990 LAS Internship (1 c.h.) must be taken on a satisfactory/unsatisfactory (S/U) basis. Students who have completed fewer than 30 credits may not register for this course. Students desiring to register for INTR 1990 LAS Internship (1 c.h.) must receive approval from the Associate Dean of the Newcomb-Tulane College before registering for the course.

Graduate Degree Programs

Students at Tulane University may pursue a Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) program in the School of Science and Engineering of Tulane University. The M.S. degree is awarded with a minimum of 24 credit hours plus a thesis. With approval, a student in some disciplines may also elect to pursue a non-thesis M.S. that requires a minimum of 30 credit hours. The Ph.D. degree is awarded with a minimum of 48 credit hours plus a dissertation. Summer research work is typically required for the timely completion of the program. The 4+1 Master's program allows students in the School of Science and Engineering to complete the requirements for both the bachelor's and master's degree in five years.

Admissions

Applicants holding the equivalent of a bachelor's degree in mathematics, science or engineering or a related field from recognized institutions may be admitted to the graduate program of the School of Science and Engineering if their academic records and personal attributes indicate ability to pursue advanced study successfully. Students must present to the appropriate department satisfactory evidence of adequate preparation for the subjects in which they seek to specialize. Ordinarily, only students whose undergraduate average is B or above are admitted. Students required to make up undergraduate course deficiencies before being admitted to the graduate program of the School of Science and Engineering may be asked to enroll in an undergraduate program as special students. Graduate credit is not awarded for courses taken to make up deficiencies. A master's degree is not a prerequisite for study for the doctorate, but a student may be required to qualify for the master's degree while working toward the doctorate.

Financial Aid and Scholarships

The School of Science and Engineering awards financial support for graduate students primarily on the basis of academic merit. For full-time students, financial assistance is available in the form of teaching assistantships, research assistantships, and fellowships, as well as partial and full tuition scholarships.

Graduate Academic Regulations

Registration Requirement

To maintain full time status all graduate students must enroll for a minimum of 9 credit hours in the Fall Semester and a minimum of 9 credit hours in the Spring Semester (or equivalent). Ph.D. and M.S. with thesis students must enroll for a minimum of 3 credit hours of "Masters Research" or 3 credits of "Dissertation Research" during the Summer Semester. Ph.D. and M.S. with thesis students who have completed all of their required course work must maintain continuous enrollment and enroll for 3 credit hours of "Master's Research" or 3 credit hours of "Dissertation Research," whichever is applicable, each semester until all degree requirements are complete.

Course Credits

Graduate work is measured in terms of credits. A credit represents a measurement of academic progress in terms of work undertaken and satisfactorily completed and is not specifically related to an hour concept for class lecture or recitation. For purposes of evaluating graduate transfer credit, in most cases a credit is equal to a semester hour.

Grades and Grade Points

The same grading system is used throughout Tulane University. A course in which a grade of C+ or less is earned cannot be counted toward a graduate degree in the School of Science and Engineering.

Conferring of Degrees

A student who has completed all of the requirements for a degree will have that degree conferred at the annual spring commencement, in May. Degrees are also conferred at the close of the fall semester in December and at the close of Summer School, in mid-August.

Transfer Credit

In general, up to 12 transfer credits may be accepted toward a master's degree, and up to 24 transfer credits may be accepted toward the doctorate. Only grades of B or better will be considered for transfer credit. The courses must be graduate courses, which were taken while the student was classified as a graduate student and after all requirements for the bachelor's degree have been met. The appropriate department and the Associate Dean for Graduate Programs must approve credit for graduate work done at other institutions. The decision concerning the acceptance of all transfer credit to the record of a graduate student will not be made until after the student has completed at least one semester of successful study in the School of Science and Engineering.

Students ordinarily must complete the requirements for the doctorate within seven years from the original date of registration. Only in unusual cases, and with the approval of the department chair and Associate Dean for Graduate Programs will credit be approved for courses taken more than six years before the date of the general or preliminary examination.

Credit for 6000-level courses taken by a senior undergraduate beyond the credits needed for an undergraduate degree at Tulane University and passed with a grade of B or better may be transferred to a graduate degree program in the School of Science and Engineering on the recommendation of the
Department Chair and with the approval of the Associate Dean for Graduate Programs. Normally, no more than 12 credits should be earned before admission to a graduate program. These credits may not be counted toward requirements for the bachelor's degree.

Transfer Between Programs
To transfer from one graduate program to another offered by the School of Science and Engineering, a student must submit an application for admission to the new program. Transferring students must fulfill any obligations they have incurred in the first program prior to receiving their degrees from the second programs. The Department Chair and Associate Dean for Graduate Programs will determine whether credit from the initial program can be applied toward a degree in the new program.

Required Withdrawal, Probation and Dismissal
A student may be required to withdraw from any course or from the university, temporarily or permanently, for any of the following reasons:

- Work below the standard specified by the School of Science and Engineering
- Violation of the Code of Academic Conduct or other misconduct
- Possibility of danger to the health of the student or to other students if enrollment is continued.

A minimum grade point average of 3.00 (B) must be maintained by all students to remain in good standing in any graduate degree program. Students whose grade point average falls below 3.00 will be considered for a probationary semester in consultation with the chair of the appropriate department. Students who receive a grade below B- or two grades of B- will also be considered for probation in consultation with the chair of the appropriate department. The terms of the probation are determined by the department chair, in consultation with the Dean or designate. Students who fail to meet the terms of their probation in two consecutive semesters will be required to withdraw from the program. Students are subject to dismissal in consultation with the appropriate department if they receive two grades below B- in a given semester. Two grades of B- are considered equivalent to one grade below B-. If a student becomes subject to dismissal during the semester in which other graduation requirements are met, the student will be excluded and will not receive the degree. Courses with grades below B- may not be used to meet degree requirements. It is the department's responsibility to report to the Dean any student not making reasonable progress toward the degree. The School of Science and Engineering and the University reserve the right to deny admission to any applicant or to forbid any student's continued enrollment without assignment of reason; to change any of its rules, courses, regulations, and charges without notice, and to make such changes applicable to students already registered as well as to new students.

Awards
Alpha Eta Mu Beta Award
This award, given by the biomedical engineering honor society, is presented to a junior for outstanding performance as a student in the biomedical engineering curriculum.

AICHE Awards
Several awards are offered. Two are scholastic awards, one offered by the New Orleans Section to the senior in chemical engineering with the highest scholastic average, and one by the National Society to the junior in chemical engineering who made the highest average in the freshman and sophomore years. The annual chapter award is for outstanding participation in chapter activities, particularly participation in the student paper presentation. The student chapter award is for outstanding services to the profession. American Chemical Society Prizes were established in 1930 by the Louisiana section of the American Chemical Society and are awarded for excellence in chemistry.

William L. Alworth Prize in Biological Chemistry
This award honors Professor Emeritus William L. Alworth who retired in June of 2004 and will be awarded annually to the outstanding graduating senior majoring in Biological Chemistry. It is based on academic and research performance.

The American Chemical Society Award
For excellence in chemistry, a senior will be honored at a dinner given by the local chapter of the American Chemical Society, and also receive a check from the department. American Institute of Chemists Award Established to honor seniors in chemistry, chemical engineering, or biochemistry. Given in recognition of potential advancement of the chemical professions on the basis of a student's demonstrated record of leadership, ability, character, and scholastic achievement.

Stuart S. Bamforth Prize
Awarded for excellence in environmental studies to the graduating senior in earth and environmental sciences or ecology and evolutionary biology.

Biomedical Engineering Graduate Student Outstanding Achievement Award
For outstanding accomplishments as a graduate student in the Department of Biomedical Engineering, Tulane University.

Biomedical Engineering Society Scholarship Award
This award is presented to the outstanding senior in biomedical engineering with the highest scholastic grade point average.

Chevron Undergraduate Award
Awarded to two students who have completed the second semester of the junior year and have the highest scholastic average.

Glendy Burke Medals were established in 1848 (oratory) and 1879 (mathematics) by Glendy Burke. They are awarded for excellence in the fields of speech and mathematics.

Fred R. Cagle Memorial Prize was established in 1981 in memory of Professor Cagle, a former chair of the Department of Zoology. The prize is awarded for outstanding achievement in ecology and evolutionary biology, taking into consideration the student's academic record, difficulty of academic program completed, and the likelihood of a substantial contribution to scholarship in integrative biology.

The Cell and Molecular Biology Prize
Special recognition for interest, enthusiasm and proficiency in Biology.

Chairman's Award
Given to a graduating senior who is outstanding in geology or earth science.

The Department of Chemistry Award for Excellence in Undergraduate Research
This award is given to Juniors/Seniors who demonstrate leadership ability, character and scholastic achievement.

Nissim Nathan Cohen Memorial Award
This award is presented to a graduating senior in Biomedical Engineering who has contributed most to his or her class, school, and the profession of Biomedical Engineering, as voted on by the senior class.

Elsie Field Dupré Memorial Prize in Physics
This award honors a female physics student for her interest, enthusiasm, and proficiency in physics.

Liz Earley Prize in Cell and Molecular Biology
Awarded for excellence and proficiency in laboratory science.

Professor Erik G. Ellgaard Award for Excellence in Cell and Molecular Biology
For the best graduating senior in Cell and Molecular Biology.

Arnold Gerall Award in Neuroscience
The award recognizes exceptional performance in academic and research activities in the area of Neuroscience by a Psychology major or a Neuroscience major advised by a member of the Psychology faculty.

Kappa Kappa Gamma Prize in Mathematics
Awarded to an outstanding undergraduate female math student.

Gerald E. Gunning Memorial Award
Awarded annually to an exceptional undergraduate major in ecology and evolutionary biology.

Gerald S. Gussack Award
Awarded to the most outstanding male graduating senior in Cell and Molecular Biology. The recipient is chosen based on excellence in grade point average, creativity in honors thesis research, and a demonstration of well-balanced academic achievement. The award is named in honor of the late Gerald Gussack, a Professor of Otolaryngology at Emory University School of Medicine, who was a 1975 graduate of Tulane College.

Rosa Cahn Hartman Medal
The award recognizes exceptional performance in academic and research activities in Psychology by a Newcomb-Tulane College senior.

Aaron Hartman Award
The award recognizes exceptional performance in academic and research activities in Psychology by a Newcomb-Tulane College senior.

Honors Thesis Award in Cell and Molecular Biology
For the student with the most outstanding thesis in Cell and Molecular Biology.

Kenneth H. Kuhn, Sr. Memorial Award Senior
Team Design Project 1st Place Winners The students are selected by a panel of judges as the 1st place winners of the Senior Team Design Project for their ability to integrate the scholarship of discovery, learning, and service, by applying biomedical engineering to improve the quality of life for people with disabilities in the New Orleans Metro Area.

The Joseph J. Kyame Physics Award
This award was established in 1990 by the physics faculty, and is given to a senior for excellence in physics.

Terry Lawson Prize in Mathematics
Awarded to a graduating senior for excellence in undergraduate mathematical research.
Anne M. McPherson Award in Psychology
The award recognizes junior or senior students who have demonstrated a capacity for cutting-edge research in the field of Psychology. Awardees should possess a strong overall grade point average and conduct research with a faculty member of the Department.

Merck Index Awards
This award is presented each year to an outstanding student in Chemistry.

The Barbara E. Moely Award for Application of Psychology
The award recognizes exceptional public service to the community.

National Society of Black Engineers
There are two awards. One is awarded to the Outstanding Executive Board member and the other is to the graduating senior with the highest grade point average.

The Neuroscience Faculty Award
The award recognizes exceptional performance in academic and research activities in Neuroscience by a Newcomb-Tulane College senior.

New Orleans Geological Society Memorial Foundation Scholarships
Awarded annually to the outstanding freshman, sophomore, junior, and senior geology or earth science majors, upon recommendation of the faculty of the Department of Earth and Environmental Sciences.

Omega Chi Epsilon Award
This award, presented by the chemical engineering honor society, is given to the member of the student chapter who best exemplifies the ideals of Omega Chi Epsilon.

Randall K. Nichols Award
Awarded to a chemical engineering junior who has special talents worthy of recognition and encouragement.

Ann Hero Northrup Prize in Chemistry (Junior or Senior)
The prize, established by the late Clare M. de Milt, consists of a valuable book or collection presented on behalf of the winner to the Howard-Tilton Library.

Phi Beta Phi Award
Given occasionally to a junior or senior for best research paper in the sciences; the recipient is chosen among the departments of cell and molecular biology, chemistry, ecology and evolutionary biology, and physics.

James Marshall Robert Leadership Award
Established in 1957 by the Society of Tulane Engineers and named in honor of Dean Emeritus Robert. Additional gifts from alumni and friends after Dean Robert’s death in 1964 have made possible the award of a medal and cash to a senior in engineering in recognition of scholarship, collegiate activities, and leadership.

ROTC Awards
Encompass many prizes and honors, including the President's Cup, for ROTC work.

Leon H. Scherck Memorial Award
The oldest award presented by the School of Engineering was established in 1922 by the late Mrs. Albert H. Scherck of New Orleans in memory of her brother, Leon H. Scherck, class of 1894, for excellence in engineering. Awarded to a member of the senior class in an engineering program.

Sigma Gamma Epsilon Prize
Established in memory of W. A. Tarr by the national geology honor society, is awarded for scholarship and service in the Department of Earth and Environmental Science.

R. A. Steinmayer Award
Established in 1957 by the Tulane geological alumni in honor of R. A. Steinmayer, emeritus professor of geology, for the outstanding graduating student in the Department of Earth and Environmental Sciences.

Francis M. Taylor Award
Established in 1971 by chemical engineering alumni to honor Professor Emeritus Taylor. Awarded to a senior in chemical engineering for outstanding citizenship, professional attitudes, and accomplishments.

Joyous and William Van Buskirk Scholarship Award
The student was selected by the biomedical engineering faculty for his outstanding achievement in biomedical engineering studies.

Daniel H. Vliet Award
Established in 1989 to honor Dr. Daniel H. Vliet who served on the faculty of Electrical Engineering for 37 years, including four years as head of the department, before his retirement in 1986. The award goes to a sophomore in an engineering program who has demonstrated superior performance in freshman physics.

**Harold E. Vokes Award**
Established in 1992 by the faculty of the Department of Geology in honor of Harold E. Vokes, professor emeritus of geology, for an outstanding graduating student in the Department of Earth and Environmental Sciences. Vokes Fellowship Awarded annually to the top Ph.D. candidate in the Department of Earth and Environmental Sciences.

**The Zoology Prize**
Awarded to a graduating senior majoring in ecology and evolutionary biology for outstanding achievement in zoology.

**Academic Policies**
A full description of academic policies for all students in Newcomb-Tulane College (https://catalog.tulane.edu/newcomb-tulane/#academicpolicies) can be found in the college's section of this catalog. Students should review these policies thoroughly.

**Degree Requirements**

**Undergraduate**
As a student in the School of Science and Engineering, you will be offered outstanding opportunities for learning and discovery in science and engineering in an environment that is student-focused, research-intensive, interdisciplinary, entrepreneurial, and responsive to the needs of the community. The School offers a broad range of undergraduate programs in the sciences, engineering, and mathematics. The undergraduate experience is further enriched by opportunities to engage in research, internships, study abroad, and public service. The School offers the Bachelor of Science, Bachelor of Science in Engineering, and Bachelor of Arts degrees.

To declare a major or minor in the School of Science and Engineering you must contact the appropriate departmental office. The Major/Minor Declaration Form (http://www2.tulane.edu/sse/academics/undergrad/upload/Major-Minor-Declaration-Form.pdf) requires the approval of the Department Chair. When declaring your major you will receive a Major Advisor to help schedule your Major and/or Minor required courses. The signed major/minor declaration form must be turned in to the student's Newcomb-Tulane advisor.

**Newcomb-Tulane College Requirements**

**General Education Curriculum**

**Newcomb-Tulane College General Education Curriculum**
Newcomb-Tulane College Core Curriculum allows students to explore a wide-range of disciplines and embodies the mission and values of the College by allowing students to have flexibility in their core curriculum courses while exploring a full-range of courses.

The core curriculum—which is composed of a minimum of 30 credits—is divided into two parts: proficiency requirements and a distribution of knowledge. To ensure that students experience the breadth of knowledge at the collegiate level, AP and IB courses can be used to satisfy proficiency requirements only in Formal Reasoning and Foreign Language.

Courses will be designated as satisfying the distribution requirements according to the content and methodology rather than the departmental affiliation of the course.

The new core curriculum general education requirements will go into effect with the entering class of 2018.

**Courses proposed to satisfy core requirements will be ratified by the Newcomb-Tulane Curriculum Committee and the Newcomb-Tulane College faculty.**

**Proficiency Requirements**

**Writing Skills (2 courses and 6 credits)**
Tulane undergraduates should be able to communicate effectively. Students completing this requirement will produce coherent texts that combine analysis, argument, and research.

- **Tier 1:** Freshman writing (ENGL 1010 or ENGL 1011) unless the student is exempt. Students receiving exemption from ENGL 1010/1011 are required to take an approved writing class during their freshman year. At least $\frac{1}{3}$ of the grade based upon writing (excluding in class exams), but no revision required.
- **Tier 2:** One additional writing course at the 2000 level or above taken from an approved list. At least $\frac{1}{3}$ of the grade based upon writing (excluding in class exams), to include revision and re-evaluation by the instructor.

*Note: creative writing courses cannot be used to satisfy the writing proficiency requirement.
Formal Reasoning (1 course and 3 credits)
One course in mathematics or symbolic logic (PHIL 1210)

Foreign Language (0-3 courses)
The foreign language proficiency is achieved by a passing grade at the 2030 level, or an AP score of 4 or 5, or a Higher-Level IB score of a 5 or higher, or an SAT II achievement test of 640 or higher, or a passing grade in a Tulane administered proficiency test. This requirement is waived for students in B.S.E. programs.

Distribution Areas (A course can satisfy only one of the distribution areas.)

Mathematics and the Natural Sciences (2 courses including 1 lab science course and 7 credits)
Tulane undergraduates should understand the methods of scientific inquiry. The mathematics and natural sciences requirement will equip students to understand and assess scientific issues that affect the world today. (Those completing the B.F.A. degree need only complete 1 course with lab.)

Social and Behavioral Sciences (2 courses and 6 credits)
Tulane undergraduates should think critically about human cultures, societies, and behaviors. This requirement acquaints students with the methods of research and inquiry in the social science disciplines.

Textual and Historical Perspectives (2 courses and 6 credits)
Tulane undergraduates should evaluate literary, philosophical, and historical texts. This area of the curriculum introduces exposes students to the methods used to examine and interpret fundamental issues of human experience.

Aesthetics and the Creative Arts (3 credits)
Tulane undergraduate students should be able to understand and appreciate the creative process and various forms of artistic expression.

Additional Core Requirements

The First Year Seminar
This requirement can be satisfied by a Tulane Interdisciplinary Seminar (TIDES) course or an Honors Colloquium course (COLQ 1010 or 1020).

Public Service
All students will complete public service that is satisfied by service learning courses, an approved internship, or research experience. These courses can also be used to satisfy other areas of general education. The nature of the requirement is to be determined by the NTC faculty. Currently this is a two-tiered experience.

Race and Inclusion
One course that focuses on race and inclusion in the United States, to be completed by end of the sophomore year. Courses that fulfill this requirement will focus at least 60% of their content on race and inclusion in the United States. These courses may also be used to satisfy other general education curriculum requirements.

Global Perspectives
One course that focuses on a global-international context from a perspective outside of the U.S., with at least 60% of content with stated objectives to develop historical, cultural, and societal knowledge of an area beyond the U.S. This requirement should be completed by end of the sophomore year. These courses can also be used to satisfy other areas of general education.

Graduate
The School of Science and Engineering has active research programs in 11 focus areas within the school and a rich variety of interdisciplinary programs linked to Tulane's School of Medicine and the Primate Research Center. While the emphasis of most programs is the training of Ph.D. scientists, some disciplines offer M.S. degrees. With 120 research faculty and over 350 students in Ph.D. programs, Tulane's Science and Engineering programs are large enough to have state-of-the art facilities, but small enough to provide an intimate research atmosphere, where faculty and students work side by side.

Master of Science
You will find masters programs at Tulane which are designed to enhance your employment opportunities as well as to assist you in pursing admission to doctoral programs and professional schools. A masters degree may take from one year to three years to complete, depending on the program.

Masters degree programs are offered in:
• Biomedical Engineering (http://www2.tulane.edu/sse/bme/academics/graduate)
• Cell and Molecular Biology (http://www2.tulane.edu/sse/cell/academics/graduate)
• Computational Science (http://www2.tulane.edu/sse/ccs/masters)
• Earth and Environmental Sciences (http://www2.tulane.edu/sse/eens/academics/graduate/master-science.cfm)
• Ecology and Evolutionary Biology (http://www2.tulane.edu/sse/eebio/academics/graduate/programs.cfm#ms-procedures)
• Materials Science and Engineering (http://www2.tulane.edu/sse/academics/graduate/mse-masters-program.cfm)
• Mathematics (http://www2.tulane.edu/sse/math/academics/graduate/programs.cfm)
• Neuroscience (http://www2.tulane.edu/sse/neuro/academics/graduate/masters)
• Interdisciplinary Master of Science (http://www2.tulane.edu/sse/academics/graduate/msinterdisciplinary.cfm)

With permission of department and instructor, students also may enroll as non-degree special students. (http://www2.tulane.edu/sse/academics/graduate/special-students.cfm)

4+1 Master’s Programs
The 4+1 Masters programs at Tulane University provide Tulane undergraduates with the opportunity to earn a masters degree in a single year following the completion of the bachelor’s degree. Tuition for the 4+1 masters programs in the School of Science and Engineering is 35% of regular graduate tuition.

4+1 Masters Degree Programs are offered in the following disciplines:

• Biomedical Engineering (http://www2.tulane.edu/sse/bme/academics/undergraduates/current/bme-ms.cfm)
• Behavioral Health
• Chemical and Biomolecular Engineering (http://www2.tulane.edu/sse/cbe/academics/graduate/degree-programs/4plusone.cfm)
• Computational Science (http://www2.tulane.edu/sse/ccs/masters)
• Ecology and Evolutionary Biology (http://www2.tulane.edu/sse/eebio/academics/undergraduate/degree-programs)
• Materials Science and Engineering (http://www2.tulane.edu/sse/academics/graduate/mse-masters-program.cfm#mse-4+1masters)
• Mathematics (http://www2.tulane.edu/sse/math/academics/graduate/degree-requirements.cfm#phd_math_4+1)
• Neuroscience (http://www2.tulane.edu/sse/neuro/academics/graduate/masters/fourplusone.cfm)
• Physics (http://www2.tulane.edu/sse/pep/academics/graduate/#master_of_science)
• Psychology (http://www2.tulane.edu/sse/psych/academics/graduate/masters-program.cfm)
• Statistics (http://tulane.edu/sse/math/academics/graduate/degree-requirements.cfm#ms_statistics)
• Interdisciplinary Master of Science (http://www2.tulane.edu/sse/academics/graduate/msinterdisciplinary.cfm)

With permission of department and instructor, students also may enroll as non-degree special students (http://www2.tulane.edu/sse/academics/graduate/special-students.cfm) at 50% graduate tuition.

Doctor of Philosophy
The School of Science and Engineering at Tulane University places significant emphasis on doctoral education. Nearly all of our over 300 doctoral students are supported by assistantships or fellowships and conduct research with over 120 faculty members. Facilities are excellent and the close knit community of students, faculty and staff serves to stimulate multidisciplinary collaboration. This characteristic is reflected in the descriptions of research programs of individual faculty.

Ph.D. programs are offered in the following areas:

• Bioinnovation Interdisciplinary Ph.D. (http://tulane.edu/bioinnovation-IGERT)
• Biomedical Engineering (http://www2.tulane.edu/sse/bme/academics/graduate/prospective/programs.cfm)
• Cell and Molecular Biology (http://www2.tulane.edu/sse/cell/academics/graduate/phd/requirements.cfm)
• Chemical and Biomolecular Engineering (http://www2.tulane.edu/sse/cbe/academics/graduate/degree-programs/phd.cfm)
• Chemistry (http://www2.tulane.edu/sse/chem/academics/graduate)
• Computer Science (http://tulane.edu/sse/cs/academics/graduate)
• Ecology and Evolutionary Biology (http://www2.tulane.edu/sse/eebio/academics/graduate/programs.cfm#phd-procedures)
• Earth and Environmental Sciences (http://www2.tulane.edu/sse/eens/academics/graduate/doctor-philosophy.cfm)
• Interdisciplinary Ph.D. in Aging Studies (http://tulane.edu/som/aging/interdisciplinary-phd-program-in-aging.cfm)
• Inter-School Programs and the Interdisciplinary Ph.D. (http://www2.tulane.edu/sse/academics/graduate/interdisciplinary-phd.cfm)
• Materials Physics and Engineering (http://www2.tulane.edu/sse/pep/academics/graduate/materials-program.cfm)
• Mathematics (http://www2.tulane.edu/sse/math/academics/graduate/phd-requirements.cfm)
• Neuroscience (http://www2.tulane.edu/sse/neuro/academics/graduate/phd)
• Physics (http://www2.tulane.edu/sse/pep/academics/graduate)
• Psychology (Psychological Science; School Psychology) (http://www2.tulane.edu/sse/psyc/academics/graduate/phd-programs)

Academic Departments

• Biological Chemistry Program (https://catalog.tulane.edu/science-engineering/biological-chemistry-program)
• Department of Biomedical Engineering (https://catalog.tulane.edu/science-engineering/biomedical-engineering)
• Department of Cell and Molecular Biology (https://catalog.tulane.edu/science-engineering/cell-molecular-biology)
• Department of Chemical and Biomolecular Engineering (https://catalog.tulane.edu/science-engineering/chemical-biomolecular-engineering)
• Department of Chemistry (https://catalog.tulane.edu/science-engineering/chemistry)
• Department of Computer Science (https://catalog.tulane.edu/science-engineering/computer-science)
• Department of Earth and Environmental Sciences (https://catalog.tulane.edu/science-engineering/earth-environmental-sciences)
• Department of Ecology and Evolutionary Biology (https://catalog.tulane.edu/science-engineering/ ecology-evolutionary-biology)
• Department of Mathematics (https://catalog.tulane.edu/science-engineering/mathematics)
• Department of Physics and Engineering Physics (https://catalog.tulane.edu/science-engineering/physics-engineering)
• Department of Psychology (https://catalog.tulane.edu/science-engineering/psychology)
• Department of River-Coastal Science and Engineering (https://catalog.tulane.edu/science-engineering/river-coastal-science-engineering)
• Interdisciplinary Graduate Degree Programs (https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs)
• Neuroscience Program (https://catalog.tulane.edu/science-engineering/neuroscience-program)