

SCHOOL OF SCIENCE AND ENGINEERING

201 Lindy Boggs
Tulane University
New Orleans, LA 70118
Phone: (504)865-5764
Fax: (504)862-8747

Website: sse.tulane.edu (<https://sse.tulane.edu/>)

Hridesh Rajan
Ph.D., University of Virginia
Dean

Lev Kaplan
Ph.D., Harvard University
Sr. Associate Dean for Academic Affairs

Laurie O'Brien
Ph.D., University of Kansas
Associate Dean for Undergraduate Programs

Michelle Sanchez
Ph.D., Stanford University
Associate Dean for Community Engagement and Academic Partnerships

Marie Dahleh
Ph.D., Princeton University
Associate Dean for Masters Programs and Broadening Participation in STEM

Daniel Shantz
Ph.D., University of Delaware
Sr. Associate Dean for Research and PhD Programs

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 two degrees at the undergraduate level, the Bachelor of Science in Engineering (B.S.E.) and the Bachelor of Science (B.S.); 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. 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.) and the Bachelor of Science (B.S.) degrees at the undergraduate level. Students also may earn certificates or minors which complement the undergraduate degree. The School offers graduate-level certificates, Master of Science (M.S.) degrees, and the Doctor of Philosophy (Ph.D.).

Undergraduate Programs

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 and Bachelor of Science in Engineering 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 (https://advising.tulane.edu/sites/default/files/MajorMinorForm_20220207_0.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.

Second Majors, Minors, and Certificates

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 or a certificate. The minor or certificate is intended to give structure to the study of a secondary field of interest chosen by the student. Students should check the requirements of the intended minor or certificate, as they vary among departments. Students must complete at least 24 credits in their major that do not overlap with the minor or certificate. Students who elect to complete the requirements for a minor or certificate 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 or towards a certificate. Individual departments may have additional restrictions on major-minor/certificate overlap. Students should consult the department listings for additional information.

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. Thirty credits are required for the M. S. degree. With approval, a student in some disciplines may elect to pursue a non-thesis M.S. that requires 30 credit hours of coursework. Thesis students take 24 course credit hours and six graded thesis research hours and complete a research thesis. 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.

Graduate 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 their 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. In most cases, graduate credit is not awarded for undergraduate courses. 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 for Doctoral Students

The School of Science and Engineering awards financial support for doctoral 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.

Selected Undergraduate and Graduate Awards

Aaron Hartman Award

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

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.

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.

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.

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.

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.

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.

The Barbara E. Moely Award for Application of Psychology

The award recognizes exceptional public service to the community.

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.

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.

Chevron Undergraduate Award

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

C. W. Ricker Award

Awarded annually to an outstanding undergraduate Engineering Physics student.

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.

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.

Elsie Field Dupré Memorial Prize in Physics

This award honors a female physics student for her interest, enthusiasm, and proficiency in physics.

Faculty Award for Research in Psychological Science honors students for contributions to research in the basic science of psychology.

Faculty Award for Applied Psychological Research honors students for applied psychological research that addresses a critical problem in society at large.

The Faculty Memorial Award in Psychology honors the memory of our departed Psychology faculty colleagues.

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.

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.

Gerald E. Gunning Memorial Award

Awarded annually to an exceptional undergraduate major in ecology and evolutionary biology.

Gerald S. Gussack Award

This award goes to the most outstanding graduating senior in Newcomb-Tulane College 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.

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.

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.

Honors Thesis Award in Cell and Molecular Biology

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

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.

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.

Joyous and William Van Buskirk Scholarship Award

The student was selected by the biomedical engineering faculty for his outstanding achievement in biomedical engineering studies.

Kappa Kappa Gamma Prize in Mathematics

Awarded to an outstanding undergraduate female math student.

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.

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.

Liz Earley Prize in Cell and Molecular Biology

Awarded for excellence and proficiency in laboratory science.

Merck Index Awards

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

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.

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.

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.

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.

Professor Erik G. Elgaard Award for Excellence in Cell and Molecular Biology

For the best graduating senior in Cell and Molecular Biology.

Randall K. Nichols Award

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

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.

Rosa Cahn Hartman Medal

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

ROTC Awards

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

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.

Stuart S. Bamforth Prize

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

Terry Lawson Prize in Mathematics

Awarded to a graduating senior for excellence in undergraduate mathematical research.

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 Zoology Prize

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

Academic Policies

Newcomb-Tulane College Policies

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

Graduate School Policies

A full description of academic policies for all students in Graduate Programs (<https://catalog.tulane.edu/graduate-degrees-professional-programs/graduate-postdoctoral-studies/policies/>) can be found in the Office of Graduate and Postdoctoral Studies section of this catalog. Students should review these policies thoroughly.

School of Science and Engineering 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). During the Summer, Ph.D. and M.S. with thesis students must enroll for 9990 or 9980, respectively. Some Departments may use equivalent courses that serve the same purpose. These are designated as "Masters Research" and "Dissertation Research" courses. Ph.D. and M.S. with thesis students who have completed all of their required course work must maintain continuous enrollment using these courses, 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 of graduate courses 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 appropriate department and the Associate Dean must approve credit for graduate work done at other institutions.

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, 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 an undergraduate 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.

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 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- also will 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, in a timely manner, any student not making reasonable progress toward the degree. The School of Science and Engineering and the University reserve the right to change any of its rules, courses, regulations, and charges without notice, and, if necessary, to make such changes applicable to students already registered as well as to new students.

Degree Requirements

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Graduate

The School of Science and Engineering has active research programs in 14 focus areas within the school and a rich variety of interdisciplinary programs linked to Tulane's School of Medicine (<https://medicine.tulane.edu/>), the Tulane National Primate Research Center (<https://tnprc.tulane.edu/>), the Bioinnovation Institute (<https://bioinnovation.tulane.edu/>), and the Bywater Institute (<https://bywater.tulane.edu/>). The school offers both Ph.D. and M.S. degrees. With approximately 130 research faculty, 350 students in Ph.D. programs, and 120 students in M.S. 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.

General Graduate School Requirements

A full description of Master's (<https://catalog.tulane.edu/graduate-degrees-professional-programs/graduate-postdoctoral-studies/masters-programs-requirements/>) and PhD Degree (<https://catalog.tulane.edu/graduate-degrees-professional-programs/graduate-postdoctoral-studies/phd-program-requirements/>) requirements for all students can be found in the Office of Graduate and Postdoctoral Studies section of this catalog. Students should review these policies thoroughly.

Undergraduate Requirements

Newcomb-Tulane College Requirements

Newcomb-Tulane College General Education Curriculum

The 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 three parts: proficiency requirements, distribution of knowledge requirements, and additional requirements. To ensure that students experience the breadth of knowledge at the collegiate level, AP, IB, and Cambridge A-Level 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 went into effect with the entering class of 2018.

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

Proficiency Requirements

Writing Skills (2 courses and 6 credits)

- Tier 1: Freshman writing (ENGL 1010 Writing or ENGL 1011 Writing for Academic Purposes) unless the student is exempt because of their score on the A.P./I.B./Cambridge-A level exams.
- Students receiving exemption from ENGL 1010 Writing/ENGL 1011 Writing for Academic Purposes are required to take an approved writing class during their freshman year. Approved courses will have at least 1/3rd of the grade based upon writing (excluding in-class exams), but no revision is required.
- Tier 2: One additional writing course at the 2000 level or above taken from an approved list. Approved courses will have at least 1/3rd of the grade based upon writing (excluding in-class exams), to include revision and re-evaluation by the instructor.
- Students are encouraged to take the Tier-1 writing course prior to taking the Tier-2 writing course; however, students are not prohibited from taking the Tier-1 and Tier-2 courses simultaneously.

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 from an approved list.

Foreign Language (0-3 courses)

The foreign language proficiency requirement is achieved in any of the following ways:

- A passing grade in a course at the 2030 level (3rd semester of Tulane 4-credit hour Foreign Language or ASLS coursework) or higher in accordance with assigned placement level.
- A passing grade on a Tulane-administered proficiency exam for students with assigned placements above the 2030 level. Students who do not successfully pass the proficiency exam will be automatically placed and must successfully complete a course at the 2030 level.
- A passing grade in a course at the level of placement above 2030.
- Advanced Placement score of 4 or 5 in a foreign language test as noted in the AP/IB chart
- Higher-Level IB score of 5 or higher in a foreign language test as noted in the AP/IB chart
- Cambridge A-Level score decided by the appropriate language department.
- SAT II achievement test of 640 or higher in a foreign language.

Note: This requirement is waived for students in B.S.E. programs.

Distribution Requirements

(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)

(Those completing the B.F.A. degree need only complete 1 course with lab)

Social and Behavioral Sciences (2 courses and 6 credits)

Textual and Historical Perspectives (2 courses and 6 credits)

Aesthetics and the Creative Arts (3 credits), which can be fulfilled in 1-3 courses.

Additional Core Requirements

The First Year Seminar (1 course, 1-3 credits)

This requirement can be satisfied by a Tulane Interdisciplinary Seminar (TIDES) course or Colloquium course (COLQ 1010 Freshmen Colloquium Seminar (1-3 c.h.) or COLQ 1020 Freshman Colloquium (1-3 c.h.))

Public Service (2 courses)

Students develop their commitment to civic engagement through the completion of service learning courses experiences. All students will complete their public service through service-learning courses, an approved public service internship, or an approved public service research experience. These courses can also be used to satisfy other areas of general education.

- To meet this requirement for graduation, all students must complete two semesters of service. One of these semesters must be at the 2000 level or above. The first experience should be completed by the 2nd semester of the sophomore year.
- Service Learning courses require a minimum of 20 hours of service per semester. Those service-learning courses designated as requiring a minimum of 40 hours of service carry one additional credit hour. No course may carry more than 4 credits.

Race and Inclusion (1 course, 3 credits)

One course and 3 credits. Courses that fulfill this requirement will focus on the intersections of race with power, privilege, equity, justice, and/or inclusion and will focus at least 60% their content on these issues in the United States. These courses may also be used to satisfy proficiency or distribution core curriculum requirements.

Global Perspectives (1 course, 3 credits)

One course and 3 credits. Courses that fulfill this requirement will focus at least 60% content with stated objectives to develop historical, cultural, and societal knowledge of an area beyond the United States. These courses may also be used to satisfy proficiency or distribution core curriculum requirements.

For more information please visit the Core Curriculum website (<https://college.tulane.edu/core-curriculum/>).

School of Science and Engineering Undergraduate Requirements

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.). Students who earn a B- or higher in MATH 1310 Consolidated Calculus (4 c.h.), [a course that combines both Calculus I and II](#), receive credit for both this course and MATH 1210 Calculus I (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.

Writing Intensive/Writing Skills Requirement

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.

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.

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 poster presentation, 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 should register for Internship Studies (course numbers and names vary) within the department sponsoring the internship after having made initial arrangements with a professor who will sponsor 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. Further, additional work (e.g., written report, reflection paper, journal, etc.) will be required to enhance the academic component of the internship. Only one internship may be completed each semester. 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.

An alternative internship experience is offered to students through INTR 1990 Liberal Arts Internship (1 c.h.). INTR 1990 Liberal Arts Internship (1 c.h.) was created to accommodate students seeking to participate in internships that require students earn credit for their experience. INTR 1990 Liberal Arts 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 Liberal Arts Internship (1 c.h.) may be applied toward the degree. INTR 1990 Liberal Arts 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 interested in registering should fill out the online application at <https://fs7.formsite.com/tulanecsc/InternshipRegistration/index.html> (<https://fs7.formsite.com/tulanecsc/InternshipRegistration/>).

Independent Study

For Science and Engineering independent study courses, up to 6 credits of independent study can be A-F graded. After 6 credits of independent study, students may take additional independent study only with Satisfactory/Unsatisfactory (S/U) graded credit. Registration is completed in the academic department sponsoring the independent study.

Academic Departments

- Center for Computational Science (<https://catalog.tulane.edu/science-engineering/center-for-computational-science/>)
- 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/>)
- Program in Biological Chemistry (<https://catalog.tulane.edu/science-engineering/biological-chemistry-program/>)

Programs

Undergraduate

Majors

- Biological Chemistry Major (<https://catalog.tulane.edu/science-engineering/biological-chemistry-program/biological-chemistry-major/>)
- Biomedical Engineering Major (<https://catalog.tulane.edu/science-engineering/biomedical-engineering/biomedical-engineering-major/>)
- Cell and Molecular Biology Major (<https://catalog.tulane.edu/science-engineering/cell-molecular-biology/cell-molecular-biology-major/>)
- Chemical Engineering Major (<https://catalog.tulane.edu/science-engineering/chemical-biomolecular-engineering/chemical-engineering-major/>)
- Chemistry Major (<https://catalog.tulane.edu/science-engineering/chemistry/chemistry-major/>)
- Computer Science Interdisciplinary Coordinate Major (<https://catalog.tulane.edu/science-engineering/computer-science/computer-science-interdisciplinary-coordinate-major/>)
- Computer Science, BS (<https://catalog.tulane.edu/science-engineering/computer-science/computer-science-bs/>)
- Earth and Environmental Sciences Major (<https://catalog.tulane.edu/science-engineering/earth-environmental-sciences/earth-and-environmental-sciences-major/>)
- Ecology and Evolutionary Biology Major (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-major/>)
- Engineering Physics Major (<https://catalog.tulane.edu/science-engineering/physics-engineering/engineering-physics-major/>)
- Environmental Biology Major (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/environmental-biology-major/>)
- Mathematics Major (<https://catalog.tulane.edu/science-engineering/mathematics/mathematics-major/>)
- Neuroscience Major (<https://catalog.tulane.edu/science-engineering/neuroscience-program/neuroscience-major/>)
- Physics Major (<https://catalog.tulane.edu/science-engineering/physics-engineering/physics-major/>)
- Psychology Major (<https://catalog.tulane.edu/science-engineering/psychology/psychology-major/>)

Minors

- Artificial Intelligence Minor (<https://catalog.tulane.edu/science-engineering/computer-science/artificial-intelligence-minor/>)
- Biological Chemistry Minor (<https://catalog.tulane.edu/science-engineering/biological-chemistry-program/biological-chemistry-minor/>)
- Biomedical Engineering Minor (<https://catalog.tulane.edu/science-engineering/biomedical-engineering/biomedical-engineering-minor/>)
- Biomedical Engineering Minor for Non-Engineering Majors (<https://catalog.tulane.edu/science-engineering/biomedical-engineering/biomedical-engineering-minor-non-engineering-majors/>)
- Cell and Molecular Biology Minor (<https://catalog.tulane.edu/science-engineering/cell-molecular-biology/cell-molecular-biology-minor/>)
- Chemistry Minor (<https://catalog.tulane.edu/science-engineering/chemistry/chemistry-minor/>)
- Civil Engineering-Water Resources and Environmental Minor (<https://catalog.tulane.edu/science-engineering/river-coastal-science-engineering/civil-engineering-water-resources-and-environmental-minor/>)
- Climate Change: Science and Practice Minor (<https://catalog.tulane.edu/newcomb-tulane/climate-change-science-and-practice-minor/>)
- Earth and Environmental Sciences Minor (<https://catalog.tulane.edu/science-engineering/earth-environmental-sciences/earth-and-environmental-sciences-minor/>)
- Ecology and Evolutionary Biology Minor (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-and-evolutionary-biology-minor/>)
- Electrical Engineering Minor (<https://catalog.tulane.edu/science-engineering/physics-engineering/electrical-engineering-minor/>)
- Engineering Science Minor (<https://catalog.tulane.edu/science-engineering/physics-engineering/engineering-science-minor/>)
- Marine Biology Minor for Biology Majors (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/marine-biology-minor-biology-majors/>)

- Marine Biology Minor for Non-Biology Majors (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/marine-biology-minor-non-biology-majors/>)
- Materials Engineering Minor (<https://catalog.tulane.edu/science-engineering/physics-engineering/materials-engineering-minor/>)
- Mathematics Minor (<https://catalog.tulane.edu/science-engineering/mathematics/mathematics-minor/>)
- Mechanical Engineering Minor (<https://catalog.tulane.edu/science-engineering/physics-engineering/mechanical-engineering-minor/>)
- Physics Minor (<https://catalog.tulane.edu/science-engineering/physics-engineering/physics-minor/>)
- Psychology Minor (<https://catalog.tulane.edu/science-engineering/psychology/psychology-minor/>)

Certificates (Undergraduate)

- Computational Engineering Certificate (<https://catalog.tulane.edu/science-engineering/physics-engineering/computational-engineering-certificate/>)
- Computer Science Certificate (<https://catalog.tulane.edu/science-engineering/computer-science/computer-science-undergraduate-certificate/>)
- Electrical Engineering Certificate (<https://catalog.tulane.edu/science-engineering/physics-engineering/electrical-engineering-certificate/>)
- Geographic Information Systems Certificate (<https://catalog.tulane.edu/science-engineering/earth-environmental-sciences/geographic-information-systems-certificate/>)

Graduate Programs

The School of Science and Engineering has active research programs in 14 focus areas within the school and a rich variety of interdisciplinary programs linked to Tulane's School of Medicine (<https://medicine.tulane.edu/>), the Tulane National Primate Research Center (<https://tnprc.tulane.edu/>), the Bioinnovation Institute (<https://bioinnovation.tulane.edu/>), and the Bywater Institute (<https://bywater.tulane.edu/>). The school offers both Ph.D. and M.S. degrees. With approximately 130 research faculty, 350 students in Ph.D. programs, and 100 students in M.S. 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.

Certificates (Graduate)

- Geographic Information Systems Certificate (Graduate) (<https://catalog.tulane.edu/science-engineering/earth-environmental-sciences/geographic-information-systems-certificate-graduate/>)
- Health Psychology Certificate (Graduate) (<https://catalog.tulane.edu/science-engineering/psychology/health-psychology-certificate-graduate/>)
- River-Coastal Science and Engineering Certificate (Graduate) (<https://catalog.tulane.edu/science-engineering/river-coastal-science-engineering/river-coastal-science-and-engineering-certificate-graduate/>)
- Trauma Focused School Psychology Certificate (Graduate) (<https://catalog.tulane.edu/science-engineering/psychology/trauma-focused-school-psychology-certificate-graduate/>)

Graduate Dual Degree Program

- Dual Degree in Landscape Architecture / River-Coastal Science and Engineering, MLAN/MS (<https://catalog.tulane.edu/architecture/landscape-architecture/landscape-architecture-river-coastal-science-engineering-mlan-ms/>)

Master of Science

Masters programs in the School of Science and Engineering are designed to enhance your employment opportunities as well as to assist you in pursuing admission to doctoral programs and professional schools. A masters degree may take from one year to two years to complete, depending on the program.

Masters degree programs are offered in:

- Applied Mathematics, MS (<https://catalog.tulane.edu/science-engineering/mathematics/applied-mathematics-ms/>)
- Behavioral Health, MS (<https://catalog.tulane.edu/science-engineering/psychology/behavioral-health-ms/>)
- Bioinnovation, MS (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/bioinnovation-ms/>)
- Biomedical Engineering, MS (<https://catalog.tulane.edu/science-engineering/biomedical-engineering/biomedical-engineering-ms/>)
- Cell and Molecular Biology, MS (<https://catalog.tulane.edu/science-engineering/cell-molecular-biology/cell-molecular-biology-ms/>)
- Chemical and Biomolecular Engineering, MS (<https://catalog.tulane.edu/science-engineering/chemical-biomolecular-engineering/chemical-biomolecular-engineering-ms/>)
- Chemistry, MS (<https://catalog.tulane.edu/science-engineering/chemistry/chemistry-ms/>)
- Computational Science, MS (<https://catalog.tulane.edu/science-engineering/center-for-computational-science/computational-science-ms/>)
- Computer Science, MS (<https://catalog.tulane.edu/science-engineering/computer-science/computer-science-ms/>)
- Data Science, MS (<https://catalog.tulane.edu/science-engineering/mathematics/data-science-ms/>)

- Earth and Environmental Sciences, MS (<https://catalog.tulane.edu/science-engineering/earth-environmental-sciences/earth-environmental-sciences-ms/>)
- Ecology and Evolutionary Biology, MS (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-ms/>)
- Electrical Engineering, MS (<https://catalog.tulane.edu/science-engineering/physics-engineering/electrical-engineering-ms/>)
- Interdisciplinary, MS (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/interdisciplinary-ms/>)
- Materials Science and Engineering, MS (<https://catalog.tulane.edu/science-engineering/physics-engineering/materials-science-engineering-ms/>)
- Mathematics, MS (<https://catalog.tulane.edu/science-engineering/mathematics/mathematics-ms/>)
- Mechanical Engineering, MS (<https://catalog.tulane.edu/science-engineering/physics-engineering/mechanical-engineering-ms/>)
- Neuroscience, MS (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/neuroscience-ms/>)
- Physics, MS (<https://catalog.tulane.edu/science-engineering/physics-engineering/physics-ms/>)
- Psychology, MS (<https://catalog.tulane.edu/science-engineering/psychology/psychology-ms/>)
- River-Coastal Science and Engineering, MS (Non-Residential) (<https://catalog.tulane.edu/science-engineering/river-coastal-science-engineering/river-coastal-science-and-engineering-ms-non-residential/>)
- River-Coastal Science and Engineering, MS (Residential) (<https://catalog.tulane.edu/science-engineering/river-coastal-science-engineering/river-coastal-science-and-engineering-ms-residential/>)
- Statistics, MS (<https://catalog.tulane.edu/science-engineering/mathematics/statistics-ms/>)

With permission of department and instructor, students also may enroll as non-degree special students.

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.

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

- Applied Mathematics (<https://catalog.tulane.edu/science-engineering/mathematics/applied-mathematics-ms/>)
- Biomedical Engineering (<https://catalog.tulane.edu/science-engineering/biomedical-engineering/biomedical-engineering-ms/>)
- Behavioral Health (<https://catalog.tulane.edu/science-engineering/psychology/behavioral-health-ms/>)
- Cell and Molecular Biology (<https://catalog.tulane.edu/science-engineering/cell-molecular-biology/cell-molecular-biology-ms/>)
- Chemical and Biomolecular Engineering (<https://catalog.tulane.edu/science-engineering/chemical-biomolecular-engineering/chemical-biomolecular-engineering-ms/>)
- Computational Science (<https://catalog.tulane.edu/science-engineering/center-for-computational-science/computational-science-ms/>)
- Computer Science (<https://catalog.tulane.edu/science-engineering/computer-science/computer-science-ms/>)
- Ecology and Evolutionary Biology (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-ms/>)
- Materials Science and Engineering (<https://catalog.tulane.edu/science-engineering/physics-engineering/materials-science-engineering-ms/>)
- Mathematics (<https://catalog.tulane.edu/science-engineering/mathematics/mathematics-ms/>)
- Neuroscience (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/neuroscience-ms/>)
- Physics (<https://catalog.tulane.edu/science-engineering/physics-engineering/physics-ms/>)
- Psychology (<https://catalog.tulane.edu/science-engineering/psychology/psychology-ms/>)
- Statistics (<https://catalog.tulane.edu/science-engineering/mathematics/statistics-ms/>)

With permission of the department and instructor, students also may enroll as non-degree special students 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 approximately 350 doctoral students are supported by assistantships or fellowships and conduct research with approximately 130 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, MS (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/bioinnovation-ms/>)
- Bioinnovation, PhD (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/bioinnovation-phd/>)
- Biomedical Engineering, PhD (<https://catalog.tulane.edu/science-engineering/biomedical-engineering/biomedical-engineering-phd/>)
- Cell and Molecular Biology, PhD (<https://catalog.tulane.edu/science-engineering/cell-molecular-biology/cell-molecular-biology-phd/>)

- Chemical and Biomolecular Engineering, PhD (<https://catalog.tulane.edu/science-engineering/chemical-biomolecular-engineering/chemical-biomolecular-engineering-phd/>)
- Chemistry, MS (<https://catalog.tulane.edu/science-engineering/chemistry/chemistry-ms/>)
- Chemistry, PhD (<https://catalog.tulane.edu/science-engineering/chemistry/chemistry-phd/>)
- Computational Science, MS (<https://catalog.tulane.edu/science-engineering/center-for-computational-science/computational-science-ms/>)
- Computer Science, PhD (<https://catalog.tulane.edu/science-engineering/computer-science/computer-science-phd/>)
- Earth and Environmental Sciences, PhD (<https://catalog.tulane.edu/science-engineering/earth-environmental-sciences/earth-environmental-sciences-phd/>)
- Ecology and Evolutionary Biology, PhD (<https://catalog.tulane.edu/science-engineering/ecology-evolutionary-biology/ecology-evolutionary-biology-phd/>)
- Electrical Engineering, MS (<https://catalog.tulane.edu/science-engineering/physics-engineering/electrical-engineering-ms/>)
- Materials Physics and Engineering, PhD (<https://catalog.tulane.edu/science-engineering/physics-engineering/materials-physics-engineering-phd/>)
- Mathematics, PhD (<https://catalog.tulane.edu/science-engineering/mathematics/mathematics-phd/>)
- Mechanical Engineering, MS (<https://catalog.tulane.edu/science-engineering/physics-engineering/mechanical-engineering-ms/>)
- Neuroscience, PhD (<https://catalog.tulane.edu/science-engineering/interdisciplinary-graduate-programs/neuroscience-phd/>)
- Physics, PhD (<https://catalog.tulane.edu/science-engineering/physics-engineering/physics-phd/>)
- Psychology, PhD (<https://catalog.tulane.edu/science-engineering/psychology/psychology-phd/>)
- River-Coastal Science and Engineering, PhD (<https://catalog.tulane.edu/science-engineering/river-coastal-science-engineering/river-coastal-science-and-engineering-phd/>)