COLLEGE OF
Science

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The College of Science offers preparation for careers in biochemistry, biological sciences, chemistry, computer science, geology and geophysics, mathematics, microbiology, and physics and astronomy. Students are also provided with strong academic backgrounds for professional study in medicine, dentistry, pharmacy, and many other careers that require in-depth study of science and mathematics.

The departments within the college, the various curricula, and the degrees that may be earned are shown in the following chart. These curricula provide broad general education as well as knowledge of the structure of science. Students in the college may also choose curricula that provide premedical or predental preparation, including curricula in biochemistry, biological sciences, chemistry with a preprofessional concentration, computer science with a life sciences concentration, and physics with a medical physics concentration. Classroom and laboratory study may be supplemented by contact with active research programs.

The Department of Computer Science offers work leading to the bachelor’s and doctoral degrees in computer science and is a participating department in the University’s graduate program leading to the Master of Science in Systems Science degree. The other departments of the college offer work leading to the bachelor’s, master’s, and doctoral degrees.

Degree Programs

All undergraduate degrees in the College of Science are Bachelor of Science degrees. The following programs are offered by the College of Science:

- Biochemistry
- Biological Sciences
- Microbiology
- Chemistry
- Computer Science
- Geology
- Mathematics
- Physics

For specific information concerning undergraduate degree programs, refer to the curricula offered by the departments on the following pages. Detailed information about graduate degree programs may be obtained from the Graduate Bulletin.

ADMISSION REQUIREMENTS

Students who contemplate entering this college should give special attention to the mathematics and science courses they select and should consult a representative of the department they plan to enter prior to completing their initial registration.

Students will be admitted to the college when they:
- have earned 24 or more semester hours of credit in courses numbered 1000 or above;
- have maintained a grade point average of at least 2.00 on both LSU and cumulative averages;
- have passed all courses in mathematics and science with grades of “C” or better or received special approval of the dean of the college;
- have passed ENGL 1001 or the equivalent with a grade of “C” or better;
- have earned credit in either MATH 1022, 1023, 1550 or 1551 with a grade of “C” or better.
- Entry into any of the three majors (biochemistry, biological sciences, and microbiology) in the Department of Biological Sciences requires earned credit in BIOL 1201 and 1202; CHEM 1201; and MATH 1550.
- Entry into any of the four secondary education concentrations (biological sciences, chemistry, mathematics or physics) requires a 2.50 LSU and cumulative GPA and passing scores on the PRAXIS I assessments or minimum ACT composite of 22 or minimum SAT composite of 1030.

Students transferring from another institution must meet University transfer admission requirements. Transfer students must also meet the current admission requirements of the senior college and receive approval of the dean of the college.

Students who, after initial enrollment in this college, wish to obtain credits from colleges or universities other than LSU and who plan to offer such credits toward their degree requirements must obtain prior approval from the dean on a specific-course basis.

DEGREE REQUIREMENTS OF THE COLLEGE

The college offers the bachelor's degree in curricula designed to give students a thorough education in a particular scientific discipline. In addition, a core of material representing a broad exposure to the human cultural heritage is an integral part of the curricula in the college. That core consists of the following course work.

English • Twelve semester hours including ENGL 1001, 2000 and six hours chosen from 2000-level or above English or Honors courses from the general education humanities list.

Mathematics • A minimum of five semester hours of calculus (Mathematics 1550). Most curricula require additional credits in mathematics. Degree credit will not be allowed for mathematics courses numbered below 1550.

Foreign Language • Students may satisfy the college foreign language requirement by passing eight semester hours in a single two-semester foreign language sequence. Ordinarily, courses numbered 1001 and 1002, or 1101 and 1102, or 1001 and 2051 are chosen.

International students whose native language is not English and who did not attend an English-speaking high school may satisfy the
foreign language requirement as follows:

• As shown above (in a language other than the student's native language); or

• By passing nine hours in his or her native language in courses that may be taken for credit by native speakers of the language; or

• By taking nine semester hours of English and/or speech (CMST) above the minimum requirements in the curriculum for the BS degree. The courses must be pre-approved by the dean and must be taken at LSU. At least three hours must be at the 2000 level or above.

Sciences • Fourteen hours including two semesters of study in the biological sciences, and a year-course in a physical science. Either the biological or physical sciences must include laboratory credits. Courses selected to meet this requirement must be chosen from courses offered by departments in the College of Science.

Social Sciences and Humanities • Fifteen semester hours in most curricula of the college. These hours are in addition to the English and foreign language requirements described above. Nine to 12 hours of the required social sciences/humanities courses must be chosen from the list of general education courses in the following way: three hours in the arts, three hours in the humanities (depending on the curriculum), and six hours in the social sciences.

Academic Policy • Following is a listing of the more important academic policies of the college offered to guide students toward degrees,

All students must complete a program of study established by the department concerned and approved by the faculty and the dean of the college.

• No curriculum in the college requires less than 120 semester hours; some curricula require more. Students in all degree programs of the college must earn at least 24 of the last 30 semester hours offered toward their degrees as registrants in the College of Science at LSU. The University requires that all candidates for the bachelor's degree must fulfill a minimum residence requirement of at least 25 percent of the total number of hours required for the degree at this University.

• Students in all degree programs of the college must earn in residence on the LSU campus (Baton Rouge) at least 18 of the hours offered toward their degrees in courses offered by departments in the College of Science. In all degree programs, at least nine of these 18 hours must be in courses numbered above 3000 and offered by the department administering the major program. Students majoring in the Biological Sciences Department must have nine semester hours in courses numbered above 3000 in their major. Research courses cannot be used in the residence requirement of nine hours numbered above 3000. A maximum of three semester hours in research courses may be used in the 18-hour residence requirement. Courses used to satisfy all residence requirements must be passed with a grade of "C" or better.

• Distance program courses and courses in which credit was earned through credit examination may not be used to satisfy the college residence requirement.

• The following courses must be passed with a grade of "C" or better: (1) all required science, computer science, and mathematics courses; (2) second discipline, and advanced sciences electives; and (3) English 1001 and 2000. If a student makes a "D" or "F" in a course requiring a "C," the course must be taken and not dropped the next semester the student is in residence and the course is offered.

• Nonparticipation courses in kinesiology may be taken for elective credit. A maximum of three semester hours will be allowed in kinesiology participation (activity) courses. Twelve semester hours of ROTC may be allowed for degree credit, with no more than six of the twelve semester hours in courses numbered below 3000. However, the sum of basic (1000-2000 level) ROTC course credits and kinesiology activity course credits allowed toward the degree may not exceed six semester hours.

• Students are expected to make reasonable and satisfactory progress in a degree program. Consequently, sequential scheduling of courses in the major field is necessary, and required courses in English and mathematics must be scheduled each semester until they are satisfactorily passed. If necessary, a required course may be dropped once, but normally, not a second time.

• Application for the bachelor's degree must be made in writing and approved by the dean of the college during the semester prior to the semester in which the degree is to be awarded.

• In order to meet graduation requirements, students must have a 2.00 on both the LSU and cumulative grade point average. A 2.50 LSU and cumulative grade point average is required for students graduating in any of the secondary education concentrations.

EARNING TWO DEGREES, OR ONE DEGREE WITH TWO MAJORS

With the dean's approval, a student may be enrolled in two bachelor's degree programs concurrently and thereby either earn two degrees, or earn one degree with two majors listed on the transcript, provided all requirements are completed as of the same commencement.

A student may earn one degree, with two majors listed on the transcript, by completing the residence and academic requirements for each major and the degree program to which it belongs. The student may earn two degrees by, in addition, earning 30 hours more than required for the degree that requires the fewer number of hours.

If the two programs are in different colleges, then the student must be accepted for admission to both colleges and must adhere to the regulations of both colleges. The student must declare a home college, where registration will be initiated and permanent files maintained, and must maintain contact with the second college to ensure that satisfactory progress is being made toward the requirements of its degree program.

COLLEGE PROBATION

A student in the College of Science who fails to earn a 2.00 semester average in a regular semester or a summer term will be placed on college probation. In addition, students who fail to meet the college academic requirements noted in the section on degree requirements, or who enter the college with deficiencies may be placed on college probation. At the discretion of the dean, a student who is on college probation and fails to meet the academic requirements, including earning a 2.00 or better semester average, may be declared ineligible to continue in the college.

A student on college probation who does earn a 2.00 or better semester gpa, who remediates course deficiencies, and who makes satisfactory progress after receiving the second warning, may be removed from college probation.

PRE-MEDICAL AND PRE-DENTAL COUNSELING

Counselors are available to help students with applications to medical and dental schools. This application process begins one and one-half years prior to professional school entry. Information regarding the pre-medical/pre-dental program at LSU and the professional school application process is available at the following Web site: http://science.lsu.edu/premedicalpredental.cfm.

The College of Science sponsors a Pre-medical/Pre-dental Review Committee that provides letters of evaluation for LSU students applying to professional schools. Students wishing to use the services of the LSU Pre-medical/Pre-dental Review Committee must: (1) have a minimum 3.0 cumulative and science gpa, (2) have been enrolled on the LSU main campus as a full-time student for the two semesters preceding the committee review, (3) attend mandatory informational meetings, and (4) meet all registration deadlines.

Further information about the committee procedures and requirements may be obtained in the dean’s office, 351 Hatcher Hall.

PASS-FAIL OPTION

Students in the College of Science may register for courses in the college on a pass/fail basis under the following conditions:

• Only students with a 2.50 average or better may participate.

• Only free elective courses may be taken on a pass/fail basis. Required courses, restricted electives, and courses germane to the major and the career for which the student is preparing may not be taken on a pass-fail basis. Registration for a course on a pass-fail basis will not be permitted until the required work in the same area has been satisfactorily completed. A student may not take courses offered by the Honors College on a pass-fail basis.

• Eligible students may take one course per semester up to a total of 12 hours toward
the degree on a pass-fail basis.
- A student must have permission (by signatures on a petition form) from the dean of this college, the instructor of the course, and the student's department chair.
- Pass-fail registration must be completed before the final day for adding courses.

Students from other colleges who wish to register for courses in this college on a pass-fail basis will present a petition form to the dean of the college. If the petition is approved, the student will then present the form to the instructor concerned for the appropriate action.

Courses offered by the College of Science that are required in a student's curriculum or are normally considered important in preparation for the student's career will not be approved on a pass-fail basis.

DISTANCE PROGRAM CREDIT
AND INTERSESSION CREDIT

Distance program credit may be accepted toward meeting degree requirements only with approval of the dean of the college and may not exceed a total of 12 hours.

Students in residence may take distance program credit only in exceptional cases (e.g., conflicts between single sections of required courses) and with specific approval of the dean of the college.

Students may not be enrolled in distance program credit the semester they intend to graduate.

Students in the College of Science may not register for more than three semester hours of credit during Intercession without approval of the dean.

STUDENT RESPONSIBILITY

Students in this college bear final responsibility for selection of their academic programs and adherence to all published regulations and requirements of the college and the University. Each student must see his or her counselor in the college office for a final degree checkout during the semester prior to the semester in which the degree is to be awarded.

MINOR FIELD REQUIREMENTS
(Optional)

A student in the College of Science may earn a minor in a second field under the following conditions:
- The minor must include at least 17 semester hours of course work, of which at least six semester hours must be taken on this campus and at least three of the six hours must be at the 3000 or 4000 level.
- Each course used in the minor must be passed with a grade of "C" or better.
- Courses used for the minor may not be taken on a pass/fail basis.
- All minors must be approved by the dean.

The department offering the minor may impose additional requirements; the specific requirements of the department must be stated in the catalog.

Students in other colleges who wish to obtain a minor in one of the departments of the College of Science must meet the same requirements listed above.

- **Biological Sciences**

  An undergraduate minor in biological sciences is available to students majoring in curricula outside the Department of Biological Sciences. Required courses are BIOL 1201, 1202, 1208, 1209, 2051, 2153, 4087, and at least three more hours of biological sciences in a course at the 3000-level (excluding BIOL 3999) or above (total of 23 hours).

- **Chemistry**

  Requirements are a minimum of 23 semester hours of chemistry: CHEM 1201, 1202, 1212 (or CHEM 1421, 1422, 1431) and a minimum of 15 semester hours at 2000 level or above. These additional 15 hours must include a two to three semester laboratory course and at least six semester hours at the 3000 level or above. The following courses cannot be taken to meet the requirements of the minor in Chemistry: CHEM 2900, 3900, 4003, and 4005. Interested students should contact the Undergraduate Chemistry Office.

- **Computer Science**

  An undergraduate minor in computer science is available. Required courses are CSC 1253, 1254, 2259, 3102, 3501, and three hours of computer science electives 3000-level and above; and 4101 or 4103 (total of 21 hours).

- **Geology**

  An undergraduate minor in geology is available (17 hrs.). Required courses are GEOL 1001, 1003, 1601, 1602. At least three of the additional hours must be taken at the 3000 or 4000 level (excluding GEOL 3909 and GEOL 3999) and on this campus.

  Honors courses offered are Geology 1002 and 1004.

- **Mathematics**

  The requirements for an undergraduate minor in mathematics are as follows: MATH 1550 (or 1551), 1552 (or 1553), 2057 (or 2058), 2085 (or 2086 or 2070 or 2090), and at least nine semester hours at the 3000- or 4000-level, but excluding MATH 3903, 3998, and 4005.

- **Nuclear Science**

  Undergraduate students on this campus may choose to minor in nuclear science. The following conditions must be met:
  - Approval from the Department of Physics & Astronomy
  - At least 15 credit hours in astronomy, nuclear science, medical physics and health physics, and physics courses, 12 of which must be taken from the following: MEDP 2051, 4111, 4331, 4332, 4351, 4995; NS 4570; and PHYS 2203, 2207, 3098, 4271

- **Physics**

  An undergraduate minor in physics is available. Required courses are: PHYS 1201, 1202, 1208, 1209 (or PHYS 2101, 2102, 2108, 2109), and PHYS 2221, and three additional courses, for a total of 20-22 hours. The three additional courses, at least one of which must be at the 4000 level, must be chosen from the following: PHYS 2203, 2231, 2411, 3098, or any three credit hour PHYS or ASTR course numbered from 4100 to 4299.

TEACHER PREPARATION
PROGRAM FOR GRADES 6-12

The departments of Biological Sciences, Chemistry, Mathematics, and Physics & Astronomy offer undergraduate degree programs with an area of concentration in secondary education (middle school and high school). Students in the program may receive a BS in biological sciences, chemistry, mathematics, or physics and qualify for teacher certification. The curricula have been developed cooperatively with faculty in the College of Education and include courses taught jointly by faculty in the College of Science and the College of Education.

Students completing these degree programs and meeting any additional requirements of the LSU Department of Education will be eligible for certification in the state of Louisiana as teachers in grades 6-12.

The following requirements pertain to students enrolled in the secondary education concentration:

Admissions Requirements:
- Minimum cumulative and LSU grade point average of 2.50
- Passing scores on all parts of the Praxis I Series or minimum ACT composite score of 22 or minimum SAT composite score of 1030

Retention Requirements:
- Minimum cumulative and LSU grade point average of 2.50 for entry into and continuation in upper (3000/4000) level education courses, including student teaching

Degree Requirements:
- Satisfactory completion of an approved program of study as determined by all of the following: faculty of the college in which the major/concentration resides, the University, the LSU P-12 Education Advisory Council, and the Louisiana Board of Elementary and Secondary Education
- Minimum cumulative and LSU GPA of 2.50 on all work completed
- Passing scores on all required parts of the Praxis II Series
- Grade of "C" or higher in course work as specified by the Louisiana Board of Elementary and Secondary Education
- A second option for students interested in middle/high school science teaching is to pursue a traditional bachelor's degree in science and then complete a master's degree in the LSU College of Education. The master's degree program (Holmes Program) begins in June and requires 12 consecutive months of

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course work and classroom experience leading to both the master's degree and teaching certification. Information about the program and potential scholarship assistance is available through the College of Education, Office of Student Services.

DEPARTMENTS AND CURRICULA

DEPARTMENT OF BIOLOGICAL SCIENCES

OFFICE • 202 Life Sciences Building
TELEPHONE • 225-578-2601
FAX • 225-578-2597
WEB SITE • wwwbiology.lsu.edu

The Department of Biological Sciences offers a comprehensive background in biology for teacher preparation, graduate studies, and for professional programs in medicine, dentistry, pharmacy, and veterinary medicine. The department offers bachelor of science degrees in biochemistry, biological sciences, and microbiology. All degrees require a core of departmental courses that include BIOL 1201, 1202, 1208, 1209, 2051, 2153, and either 4087 or 4093 and 4094. In addition, all students are required to take 20–25 hours of electives from courses numbered 3000 and above in biological sciences that include two courses with laboratories and at least one course from three of four departmental groupings (described below). Students seeking the bachelor of science degree in biological sciences may fulfill the requirement for 20 hours of electives with courses from all areas of the department while students seeking the biochemistry and microbiology degrees take courses specific to those degrees. All students in the department may earn a maximum of six hours of BIOL 3999. A maximum of three hours of BIOL 3999 may be taken as advanced biochemistry, biological sciences, or microbiology electives. BIOL 3999 may not be used as a laboratory course. Students may earn more than one degree in the department but biological science courses numbered 3000 and above (excluding the core biochemistry courses) may only be applied to one degree. This policy also applies to transfer students who enter with a degree earned in one of the Department of Biological Sciences majors. Majors in the department are ineligible for the departmental minor.

Admission into the Department of Biological Sciences

In addition to admission to the College of Science, entry into any of the three majors (biochemistry, biological sciences, and microbiology) in the Department of Biological Sciences requires earned credit in BIOL 1201 and 1202; CHEM 1201; and MATH 1550.

Curriculum in Biochemistry

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Approved biochemistry electives must come from the following list, must include at least one laboratory course, and must include at least one course from both Group 1 and Group 3 and two courses from Group 2:

- Group 1: BIOL 4596; CHEM 4150 (ENVS 4101), 4160, 4512, 4561, 4562, 4563, 4564, 4570, 4572
- Group 2: BIOL 3060 (PLHL 3060), 3090, 3156, 4110, 4132, 4142, 4157, 4190, 4246, 4385, 4400, 4482, 4596, 4753; 2) physiology, anatomy, and development: BIOL 3060 (PLHL 3060), 3152, 3156, 4106 (ENTM 4016), 4110, 4155, 4157, 4158, 4160, 4165, 4170, 4200, 4444 (PLHL 4444); 3) ecology and evolution: BIOL 3040, 4015 (ENTM 4015), 4084 (GEOL 4084), 4090 (OCS 4056), 4253, 4256 (AGRO 4056/EMS 4056), 4262, 4299, 4308 (OCS 4038), 4600 (RNR 4600); 4) organismal diversity: BIOL 4002 (ENTM 4002), 4020 (RNR 4020), 4041, 4053, 4054 (PLHL 4054), 4084 (GEOL 4084), 4105, 4125, 4126, 4141, 4142, 4145 (RNR 4145), 4146, 4154, 4162 (FDSC 4162), 4163 (FDSC 4163), 4600 (RNR 4600), 4653.

Areas of Concentration

- Marine Biology (18-19 hrs.)

Students may obtain an area of concentration in Marine Biology by meeting the requirements of the biological sciences degree, incorporating the following courses into their program of study.

Required courses (18-19 hrs.) OCS 1005; BIOL 4262; BIOL 4090, or 4145 or 4154; and 8-9 hrs chosen from BIOL 3040, 3999, 4020, 4090, 4145, 4154, 4253, 4254, 4263, 4308, 4600 and 4653.

- Secondary Education (47 hrs.)

This concentration is part of the Geaux Teach–Math and Sciences Program. Students will obtain a degree in biological sciences and, upon completing this concentration, and meeting any additional requirements of the Louisiana Department of Education, will be eligible for certification in the state of Louisiana as teachers in grades 6-12. This...
DEPARTMENT OF CHEMISTRY

CHAIR • Maverick OFFICE • 232 Choppin Hall TELEPHONE • 225-578-3361 FAX • 225-578-3458 WEB SITE • http://chemistry.lsus.edu

Students obtain a thorough working knowledge of the fundamentals of chemistry, supplemented by study in physics, mathematics, and other sciences. The curriculum is further enriched by the requirement of a broad basic background in the social sciences and humanities. The department offers special lecture and laboratory courses for its majors.

Chemistry majors must select one of nine areas of concentration, preferably in their sophomore year. The different concentrations can be grouped according to whether or not they prepare the student for an active career in chemistry or for another profession, such as medicine, dentistry, or veterinary medicine.

Active Careers in Chemistry • These concentrations are recommended for students who seek a professional career in chemistry or plan to pursue graduate studies in chemistry or a closely related field. The areas of concentration listed in this section are certified by the American Chemical Society. Students successfully completing those concentrations will receive a certificate upon graduation. The biological chemistry concentration strengthens the student’s knowledge of the chemistry and structure of living systems. The chemical physics concentration emphasizes understanding chemical systems based on fundamental physical, mathematical, and theoretical principles. The chemistry concentration provides a broad background in chemistry. It is recommended to students who desire a career in chemistry but do not yet know which branch of chemistry best suits them. The environmental chemistry concentration is recommended for preparation as a chemical professional or for entrance to graduate study in chemistry, but with an environmental emphasis. The materials concentration makes the connection between chemistry and a wide range of practical materials used to fabricate electronic, optical, and other devices. The polymer concentration is designed for students with career objectives in the science of synthetic or biological macromolecules, including plastics. The secondary education concentration leads to certification as a chemistry teacher in grades seven through 12.

Chemistry for Other Professions • The preprofessional concentration is designed primarily for students who will apply for graduate education in another profession, such as medicine, dentistry, or veterinary medicine. The chemistry and a second discipline concentration allows students to develop their interests and abilities in other disciplines outside of chemistry, whether or not graduate education is contemplated. Students may choose second disciplines such as computer science, geology, engineering, business administration, history, foreign languages, political science, and others.

Areas of Concentration

* Biological Chemistry (22 hrs.)

Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.

FRESHMAN YEAR SEM. HRS. BIOL 1201 or 1202**.................. 6-8 CHEM 1201 or 1202; 1421; 1422; 1431*........ 8 ENGL 1001........................ 3 MATH 1057.................... 3 PHYS 2101, 2102, 2108, 2109 .. 8 Approved electives or concentration courses. 6

JUNIOR YEAR SEM. HRS. CHEM 3491, 3492, 3493........ 9 Six hrs. chosen from 2000-level or above ENGL or HNRS courses from the general education humanities list ............ 6 General education social sciences course .......... 3 General education social sciences course (2000 level or above) ......... 3 Approved electives or concentration courses. 3-1

SENIOR YEAR SEM. HRS. CHEM 4570............................... 3 Approved social sciences/humanities courses ........................................ 6 Approved electives or concentration courses. 23 32

Areas of Concentration

* Biological Chemistry (22 hrs.)

Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.

† Chemical Physics (25-26 hrs.)

Students completing this concentration will receive American Chemical Society certification.

†† The preprofessional concentration is designed primarily for students who will apply for graduate education in another profession, such as medicine, dentistry, or veterinary medicine. The chemistry and a second discipline concentration allows students to develop their interests and abilities in other disciplines outside of chemistry, whether or not graduate education is contemplated. Students may choose second disciplines such as computer science, geology, engineering, business administration, history, foreign languages, political science, and others.

Areas of Concentration

* Biological Chemistry (22 hrs.)

Students completing this concentration will receive American Chemical Society certification.

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Areas of Concentration

* Biological Chemistry (22 hrs.)

Students completing this concentration will receive American Chemical Society certification.

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Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.

†† The preprofessional concentration is designed primarily for students who will apply for graduate education in another profession, such as medicine, dentistry, or veterinary medicine. The chemistry and a second discipline concentration allows students to develop their interests and abilities in other disciplines outside of chemistry, whether or not graduate education is contemplated. Students may choose second disciplines such as computer science, geology, engineering, business administration, history, foreign languages, political science, and others.

Areas of Concentration

* Biological Chemistry (22 hrs.)

Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.

† Chemical Physics (25-26 hrs.)

Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.

†† The preprofessional concentration is designed primarily for students who will apply for graduate education in another profession, such as medicine, dentistry, or veterinary medicine. The chemistry and a second discipline concentration allows students to develop their interests and abilities in other disciplines outside of chemistry, whether or not graduate education is contemplated. Students may choose second disciplines such as computer science, geology, engineering, business administration, history, foreign languages, political science, and others.

Areas of Concentration

* Biological Chemistry (22 hrs.)

Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.

† Chemical Physics (25-26 hrs.)

Students completing this concentration will receive American Chemical Society certification.

** The biological chemistry, pre-professional, and secondary education concentrations also require Biological Sciences 1208 and 1209 laboratories.
Recommended for preparation as a chemical professional or for entrance to graduate study in chemistry. Students completing this concentration will receive American Chemical Society certification.

**Chemistry electives:** CHEM 4451, 4594, 4596, 4597

**Physics electives:** PHYS 2221, 2231, 2411, 4123, 4125, 4141, 4142, 4251, 4261

- **Chemistry (24 hrs.)**
- **Chemistry and a Second Discipline (21 hrs.)**
- **Second Discipline Electives:** Courses should form a coherent sequence in one department with at least three courses numbered 3000 or above. If courses are from more than one department, student must obtain a minor in that discipline. Selection of the concentration courses should be completed and approved by the department and dean’s office by the end of the sophomore year.

- **Environmental Chemistry (21 hrs.)**

Students completing this concentration will receive American Chemical Society certification. Students will obtain a degree in chemistry and, upon completing this concentration and meeting any additional requirements of the Louisiana Department of Education, will be eligible for certification in the state of Louisiana as teachers in grades 6-12.

**Students completing this concentration will receive American Chemical Society certification.**

**Recommended for preparation as a chemical professional or for entrance to graduate study in chemistry. Students completing this concentration will receive American Chemical Society certification.**

**Chemistry electives:** CHEM 4552, 4553, 4564, 4571 or 4572, six sem. hrs. of Chemistry electives; three sem. hrs. CSC programming course.

**Chemistry electives:** CHEM 3900 (additional hrs.), 4010, 4011, 4150, 4160, 4561, 4562, 4563, 4571, 4572, 4581, 4594, 4597

- **Chemistry and a Second Discipline (21 hrs.)**

- **Second Discipline Electives:** Courses should form a coherent sequence in one department with at least three courses numbered 3000 or above. If courses are from more than one department, student must obtain a minor in that discipline. Selection of the concentration courses should be completed and approved by the department and dean’s office by the end of the sophomore year.

- **Environmental Chemistry (21 hrs.)**

Students completing this concentration will receive American Chemical Society certification.

**Chemistry electives:** CHEM 4451, 4594, 4596, 4597

- **Physics electives:** PHYS 2221, 2231, 2411, 4123, 4125, 4141, 4142, 4251, 4261

- **Environmental Chemistry (21 hrs.)**

Students completing this concentration will receive American Chemical Society certification. Students will obtain a degree in chemistry and, upon completing this concentration and meeting any additional requirements of the Louisiana Department of Education, will be eligible for certification in the state of Louisiana as teachers in grades 6-12.

**Required courses:** BASC 2010, 2011; EDCI 2506, 3550, 4500, 3136, 4006; PHIL 2786; CHEM 4003, 4005; BIOL 2083; 3 hrs. of CHEM electives.

**Chemistry electives:** CHEM 4010, 4011, 4150, 4160, 4552, 4553, 4561, 4562, 4563, 4571, 4572, 4581, 4594, 4597

In addition, the student must take EDCI 2500 as one of the General Education social science courses and PHIL 2786 as one of the approved social science/humanities courses. Students should plan their course work so that the last semester of the senior year can accommodate the 12 hrs. that are required to be taken concurrently (EDCI 4006 and 3136). BIOL 1208 and 1209 labs should be included in the freshman year.

**DEPARTMENT OF COMPUTER SCIENCE**

**OFFICE • 298 Coates Hall**

**TELEPHONE • 225-578-1495**

**FAX • 225-578-1465**

**WEB SITE • www.csc.lsu.edu**

The mission of the program is to instill in the student theoretical and applied practical skills needed to solve challenging problems using a computer. Graduates of the program use such concepts as abstraction and complexity analysis to solve innovative problems or to orchestrate evolutionary change as applied to the development of software. The program provides a strong foundation such that students can build on their skill sets as the field rapidly evolves.

The program objectives for the BS degree candidate in computer science are:

- to provide students with basic knowledge, both theoretical and applied, in core areas of computer science
- to enable students to develop skills in system and software design and to be able to apply these skills to solve diverse problems
- to train students to become proficient in implementing algorithms in a variety of programming languages
- to enable students to develop skills for working as part of a team on assignments or research projects
- to enable students to present their work effectively in oral and written form
- to provide students with an awareness of ethical issues and the global impacts of computing technologies on society
- to prepare students for lifelong study including graduate study and/or successful professional careers

Upon graduation, graduates should be able to:

- Use their knowledge in core and emerging areas in computer science to solve diverse computational problems
- Use their knowledge of system and software design to formulate a solution that meets the design requirements and specifications for diverse applications
- Demonstrate proficiency in implementing algorithms in at least one higher-level programming language
- Work effectively in a team environment
- Demonstrate proficient oral and written communication skills
- Demonstrate an understanding of ethical issues and issues relating to the impacts of computing technologies on society
- Understand the importance of continual study in the field, and find employment with a business and/or research organization or acceptance into graduate school for further academic pursuits

The undergraduate computer science curriculum is structured around basic courses in computer science and mathematics. The curriculum is designed to allow a flexible plan of study via the mandatory selection of one of three concentrations: networking, software engineering, and computer science and a second discipline. A concentration should be declared at the beginning of the sophomore year. If the second discipline concentration is selected, an approval form must be completed and approved by the department and the dean’s office.

Computer science students will not receive degree credit for the following courses: CSC 4602; ELRC 4006; EXST 2000, 2085, 2201, 3001, 4001, ISDS 2000, 2001, 3001, 3002, 3107; PSYC 2011, 4111; and SOCL 2201. Computer science students may not receive credit for both IE 3302 and ISDS 2000, or for both IE 4510 and ISDS 2001.

**CURRICULUM IN COMPUTER SCIENCE**

**TOTAL SEM. HRS. • 123**

1 See college list of approved general education natural sciences courses.

2 If a 10-hour foreign language sequence is taken, the extra two hours will be counted toward approved electives.

3 Students who have completed the prerequisites may substitute MATH 3355 or EE 3140 or EXST 4050.

4 The computer science senior elective (three semester hours) must be an approved 4000-level computer science course.

**FRESHMAN YEAR**

**SEM. HRS.**

<table>
<thead>
<tr>
<th>CSC 1200, 1350, 1351</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>ENGL 1001 .............</td>
<td>3</td>
</tr>
<tr>
<td>Three hrs. chosen from 2000-level or above ENGL or HNRS courses from the general education humanities list ...........</td>
<td>3</td>
</tr>
</tbody>
</table>
MATH 1550, 1552............................................. 9
Biological or physical sciences sequence* .......................... 6
General education humanities............................................. 3
Communication studies course......................................... 3

**SOPHOMORE YEAR** SEM. HRS.
CSC 2259, 3102, 3380 ............................................. 9
Computer science elective 2000-level or above or computer science area requirement......................................................... 3
Three hrs. chosen from 2000-level or above
ENG or HNRS courses from the general education humanities list ................................................................. 3
ENG 2000 ................................................................. 3
MATH 2000 ................................................................. 4
General education biological or physical sciences sequence with lab.............................................................. 8
General education social sciences course .................................................. 3

**JUNIOR YEAR** SEM. HRS.
CSC 2262, 3501, 4101 ............................................. 9
Computer science electives 3000-level or above or computer science area requirement......................................................... 3
Foreign language courses* .............................................. 8
IE 3302 ................................................................. 3
General education social sciences course at the sophomore level or above .......................................................... 3
Approved elective or area requirements ...................................... 6

**SENIOR YEAR** SEM. HRS.
CSC 4103, 4330 ........................................................... 6
Computer science elective 3000-level or above or computer science area requirement......................................................... 3
Computer science senior elective* or computer science area requirement ................................................................. 3
Approved electives or area requirements ...................................... 9
General education arts courses.............................................. 9
Social sciences/humanities course ........................................... 3

Areas of Concentration

* Computer Science and Second Discipline (24 hrs.)

In addition to three credit hours each from a CSC 2000-level or above elective, a CSC 3000-level or above, and a CSC senior elective, an approved second discipline concentration consists of 15 sem. hrs. of electives in one area outside of the Department of Computer Science. All courses must be taken from a single department except when a university minor is obtained. Courses in the second area are to form a coherent sequence; where possible students should take courses required of a major in that department. Ordinarily, there should be at least two courses numbered 3000 or above. Courses chosen from Information Systems and Decision Sciences must be numbered ISDS 3100 or above. The approval form must be submitted no later than the sophomore year with the consent of the departmental advisor and the dean’s office.

* Distributed Systems and Networking (18 hrs.)

**Required courses** (9 hrs.)—CSC 4304, 4501, 4999
**Approved area electives** (9 hrs.)—no more than two elective courses from the same department; EE 4610, 4625, 4660; IE 4426; ISDS 4111, 4120, 4123 or CSC 4601; MATH 3355, 4023, 4025, 4325, 4470; other electives subject to approval

**Software Engineering (18 hrs.)**

**Required courses** (9 hrs.)—CSC 2000-level or above area elective; CSC 4351, 4402
**Approved area electives** (9 hrs.)—CSC 4304, 4370, 4800; EE 4760; IE 4461; ISDS (max. of 6 hrs.) from 4110, 4111, 4112, 4113, 4114, 4125, 4141, 4501, 4502, 4511; other electives subject to approval

### DEPARTMENT OF GEOLOGY & GEOPHYSICS

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**E-MAIL** geology@lsu.edu

The geology curriculum prepares undergraduates for graduate study in geology and geophysics and related fields and for a wide range of professional careers, including teaching, research, resource exploration and development, and environmental management and remediation. The curriculum has three areas of concentration: geology, environmental geology, and geophysics. Geology students in the geology and environmental concentrations follow the same basic curriculum during the first five semesters of study. Students during this time receive a firm foundation in mineralogy, petrology, structural geology, and sedimentology, as well as basic courses in biology, chemistry, physics, and mathematics. The geophysics concentration has additional emphasis on mathematics and physics. Emphasis for all concentrations is on fundamental geologic processes operating on and within the earth. Laboratory and field studies are integrated into the curriculum at all levels and include a six-week field geology course at the department’s permanent field camp in the Colorado Front Range.

The curriculum is designed to leave much of the final three semesters of study relatively unstructured so that students, with the guidance and approval of the department, can develop a program of advanced coursework most appropriate to their area of concentration and career objectives. Students selecting the geology and environmental geology concentrations take, in addition to the first five semesters of courses, history of the biosphere and nine hours of geology 4000-level electives. Students selecting the environmental geology area of concentration take physical hydrogeology. Students selecting the geophysics area of concentration take additional mathematics and physics courses as well as plate tectonics, and well-logging in petroleum engineering, and twelve hours of geology courses at the 4000 level. All three areas of concentration are designed to provide students with a sound foundation in basic geology and to prepare them for entry into a graduate program or directly into a professional career.

Graduate and undergraduate majors in geology must pay a $35 field service fee each semester. Students not majoring in geology who schedule courses requiring field trips will be assessed a pro rata portion of the amount above as determined by the department chair. Part-time students enrolled in seminar courses only and students registered for thesis or dissertation only are exempt from the fee. Additional information concerning fees for field geology courses is available from the Geology Field Camp Director, Department of Geology & Geophysics.

### CURRICULUM IN GEOLOGY

**TOTAL SEM. HRS.** 123

* See area requirements.

**FRESHMAN YEAR** SEM. HRS.
General Education art course ............................................. 3
CHEM 1201, 1202, 1212 ........................................... 8
Approved Electives .................................................... 3
MATH 1550, 1552 ....................................................... 9
ENGL 1001 ............................................................... 3

**SOPHOMORE YEAR** SEM. HRS.
Approved electives .................................................... 3-4
BIOL 1201, 1202 ....................................................... 6
ENGL 2000 ............................................................... 3
Three hrs. chosen from 2000-level or above
ENG or HNRS courses from the general education humanities list ................................................................. 3
GEOL 2081 ............................................................... 3
Area of concentration course ............................................. 3
General education social sciences courses
(one course must be at the sophomore level or above) ................................................................. 6
PHYS 1201 or 2101, and 1208 or 2108 ................................... 5-4

**JUNIOR YEAR** SEM. HRS.
Approved electives .................................................... 0-3
Three hrs. chosen from 2000-level or above
ENG or HNRS courses from the general education humanities list ................................................................. 3
Foreign Language courses ............................................... 10-8
Approved Soc. Sci./Humanities course .................................... 3
GEOL 3032 ............................................................... 3
GEOL 3041 ............................................................... 4
GEOG 307 ............................................................... 4
PHYS 1202 or 2102 or 2002, and 1209 or 2109 ................................... 5-4

**SUMMER** (FOLLOWING JUNIOR YEAR) SEM. HRS.
GEOL 3666 ............................................................... 6

**SENIOR YEAR** SEM. HRS.
Area of concentration courses ........................................... 9-22
Approved electives .................................................... 13-0

### Areas of Concentration

* Environmental Geology (15 hrs.)

Recommended as preparation for a career in environmental geology and related fields or entrance to graduate study.
Required Courses (15 hrs.): GEOL 2061, 4182; nine hours of geology electives that must be chosen from GEOL 4023, 4043, 4062, 4064, 4081, 4083, 4084, 4085 and 4164, of which three hours must be chosen from GEOL 4043, 4062, 4084, and 4085.

The following courses are useful free electives in environmental geology: GEOL 4165, GEOG 4023, 4041, 4042, 4046, 4047, 4048, 4070, 4082, 4083; CHEM 4130; OCS 3103, 4040; RNRR 4025, 4151, and 4900; ENVS 4000-level courses.

♦ Geology (12 hrs.)

♦ Required Courses (12 hrs.): GEOL 2061; nine hours of GEOL 4000-level courses.

♦ Geophysics (24-25 hrs.)

Recommended as preparation for a career in geophysics and related fields or entrance to graduate study.

Sophomore Year • MATH 2065 or 2090 (3-4 sem. hrs.)
Junior Year • PETE 3036 (3 sem. hrs.)
Senior Year • GEOL 4066; PHYS 2203 and six hours of geology electives that must be chosen from GEOL 4062, 4064, and 4068; and six additional hours of 4000-level geology electives (18 sem. hrs.)

The following courses are useful free electives in geophysics: GEOL 2061; GEOG 4048

DEPARTMENT OF MATHEMATICS

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Students majoring in mathematics may choose from several areas of concentration. (See "Areas of Concentration" below.) Each concentration requires the following lower division mathematics courses (totaling 22 sem. hrs.): 1550 (or 1551), 1552 (or 1553), 2057 (or 2058), 2060, 2085 (or 2086), and two courses from 2020, 2025, 2030. Each concentration requires additional courses (see below) and a capstone experience. Credit for mathematics courses numbered below 1550 will not be counted toward the required credits for mathematics majors.

Those students who are planning to pursue a graduate degree in mathematics are strongly advised to include MATH 4031, 4032, 4035, 4153, and 4200 in their curriculum even if they do not select the mathematics area of concentration.

Honors courses offered in mathematics are MATH 1551, 1553, 2058, and 2086. The honors option is available to students in upper division mathematics courses. (See "Honors Option" in the Honors College section in this catalog.) A special curriculum leading to the BS degree in mathematics with departmental honors is offered. Details are available from the departmental office.

CURRICULUM IN MATHEMATICS

TOTAL SEM. HRS. • 120

Consult "Degree Requirements of the College" in this section of the catalog for specific instructions regarding electives and the general education literature and social sciences requirements.

♦ Freshman Year • MATH 1550/1551, and 1552/1553. Required Courses: If first science sequence is taken from the physical sciences, the second course sequence must be taken from the life sciences, and vice versa.

FRESHMAN YEAR SEM. HRS.
ENGL 1001 .................................................. 3
Two-course sequence in a foreign language .................................. 8-10
MATH 1550/1551, and 1552/1553 .................................. 9
General education natural science course sequence with lab(s) ...................... 8

.......................................................... 28-30

SOPHOMORE YEAR SEM. HRS.
ENGL 2000 .................................................. 3
Social science or humanities course .................................. 3
Three hrs. chosen from 2000-level or above ENGL or HNRS courses from the general education humanities list. ..... 3
Select two courses from MATH 2020, 2025, and 2030 ................................... 6
MATH 2057, 2060, 2085 ..................................... 7
General education natural science course .................................. 3
General education natural science course sequence in alternate area+ .......................... 6

.......................................................... 31

JUNIOR YEAR SEM. HRS.
Area requirements ....................................... 12
Three hrs. chosen from 2000-level or above ENGL or HNRS courses from the general education humanities list. ..... 3
General education social science course .................................. 3
Social science or humanities course .................................. 3
Approved elective or area requirements .................................. 9

.......................................................... 30

SENIOR YEAR SEM. HRS.
MATH courses area requirements .................................. 6
General education arts course .................................. 3
Approved electives or area requirements .................................. 22-20

.......................................................... 31-29

Areas of Concentration

♦ Actuarial Science (38 hrs.)

ACCT 2001, ECON 2030, FIN 3715, EXST 2201, 3201, MATH 3355, 4050, 4056, 4058; Select one course from MATH 4020, MATH 4997, or EXST 4087; Select two courses from MATH 4023, 4025, 4031, 4032, 4035, 4065, 4066, or 4153.

♦ Applied/Discrete Mathematics (21 hrs.)

MATH 4023, 4025, 4171, 4172, and either 4020 or 4997. Select two courses from MATH 3355, 4024, 4027, 4065, 4066, 4153, 4181, 4340, 4470.

♦ Mathematical Statistics (29 hrs.)

EXST 2201, 3201, 4012; MATH 3355, 4031, 4056; select two courses from MATH 4035, 4058, 4153; select one course from either MATH 4020, MATH 4997, or EXST 4087.

♦ Mathematics (21 hrs.)

MATH 4200, 4031, and either 4032 or 4035. (9 hours)

Either MATH 4020 or 4997. (3 hours)

Select three courses from MATH 3355, 4027, 4032, 4035, 4036, 4039, 4153, 4065, 4171, 4172, 4181, 4201, 4325, 4340, 4345, 4470, 4700, 4997, 4999. (9 hours)

At most six credit hours of the 21 hours in the concentration may be from MATH 4020, 4997 or 4999.

♦ Secondary Education (48 hrs.)

This concentration is part of the Geaux Teach–Math and Sciences Program. Students will obtain a degree in mathematics and, upon completing this concentration and meeting any additional requirements of the Louisiana Department of Education, will be eligible for certification in the state of Louisiana as teachers in grades 6-12.

Required courses: BASC 2010, 2011; MATH 3002, 3003, 3355, 4005, 4031, 4019; EDCI 2500, 2550, 4500, 3136, 4006; PHIL 2786; BIOL/Chem/PHYS 4005 (42 hrs.)

Select three hrs. from MATH 4200, 4023, 4181. Select three hrs. from MATH 4024, 4027, 4032, 4036, 4039, 4056, 4065, 4153, 4171, 4172, 4201, 4325, 4340, 4345, 4470, 4700, 4999.

EDCI 2500 will count as one of the General Education social science courses and PHIL 2786 as one of the approved social science/humanities courses. Students should plan their course work so that the last semester of the senior year can accommodate the 12 hrs. that are required to be taken concurrently (EDCI 4006 and 3136).

DEPARTMENT OF PHYSICS & ASTRONOMY

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The Department of Physics & Astronomy offers master's degrees for medical physics studies. For additional information, see the section, "Graduate School and Professional Programs" in this catalog.

CURRICULUM IN PHYSICS

TOTAL SEM. HRS. • 129

Students planning to enter graduate school are encouraged to select a modern foreign language.

FRESHMAN YEAR SEM. HRS.
Three hrs. chosen from 2000-level or above ENGL or HNRS courses from the general education humanities list. .......................... 3
any additional requirements of the Louisiana Department of Education, will be eligible for certification in the state of Louisiana as teachers in grades 6-12.

Required courses (35 hrs): BASC 2010, 2011; EDCI 2500, 3550, 4500, 3136, 4006; PHIL 2786; PHYS 4005; ASTR 1101, 1102 or CHEM 1201, 1202; and two PHYS 4000 electives.

EDCI 2500 will count as one of the General Education social science courses and PHIL 2786 as one of the approved social science/humanities courses. Some general education courses are taken in different years than in the standard curriculum. Students should plan their course work so that the last semester of the senior year can accommodate the 12 hrs. that are required to be taken concurrently (EDCI 4006 and 3136). PHYS 4125 and 4132 are not required for this concentration, but may be used as physics 4000 electives.

PHI BETA KAPPA

Seniors and juniors with gpa of at least 3.60 and 3.90, respectively, are considered for membership in Phi Beta Kappa, the oldest scholastic honor society in the United States. Excellence in a variety of intellectual disciplines, rather than proficiency in a single field of study, is the major criterion for election.

The academic record should include satisfactory completion of the general education requirement, including two courses in English or American literature or literature in a foreign language (if not the major field); six-hour sequences in both a life science and a physical science, with an additional two hours of related laboratory work in one of these fields; upper division courses (3000 level or above) in at least two different humanities or social sciences outside the major; and electives that show a commitment to a liberal education.

Sophomores and juniors with high gpas should consult with Phi Beta Kappa officers or college counselors for more specific information. Specific requirements are described on the Phi Beta Kappa Web site lsu.edu/student_organizations/phibetakappa/.

PHI KAPPA PHI

Founded in 1897 at the University of Maine, Phi Kappa Phi is the nation’s oldest, largest, and most selective honor society for all academic disciplines. Its chapters are on nearly 300 campuses in the United States, Puerto Rico, and the Philippines. Each year, approximately 30,000 members are initiated. Some of the organization’s more notable members include former President Jimmy Carter, writer John Grisham, NASA astronaut Wendy Lawrence, and Netscape founder James Barksdale. The LSU chapter was founded in 1930 as the 43rd chapter in the nation.

The mission of Phi Kappa Phi is to recognize and promote academic excellence in all fields of higher education and to engage the community of scholars in service to others. Phi Kappa Phi is unique because it recognizes superior scholarship in all academic fields, rather than restricting membership to a limited field. Juniors in the top 7.5 percent and seniors and graduate students in the top 10 percent of their classes may be invited to become members of Phi Kappa Phi. New LSU Phi Kappa Phi members are initiated and honored in the spring semester each year and wear identifying ribbons on their academic gowns at commencement exercises. Additional information about the Society may be found at www.phikappaphi.org.