Southeastern Louisiana University

# Department of Chemistry & Physics

The Department of Chemistry and Physics offers four-year curricula in both Chemistry and Physics. Since the Chemistry Department is approved by the American Chemical Society (ACS), chemistry graduates may receive diplomas certified by the ACS. Pre-professional programs in engineering, medicine, dentistry, optometry, and pharmacy are also offered.

Students in Medicine and Dentistry are encouraged to complete the requirements for a degree before entering a medical or dental school. However, in the event that a student is accepted into medical or dental school prior to receiving the baccalaureate degree, that student may still become a candidate for the Bachelor of Science degree from Southeastern Louisiana University by completing the following requirements. The student must: 1) complete 90 credit hours (the last 30 in residence), 2) complete 20 hours of chemistry above the freshman level (all chemistry courses must be chosen

from those courses required of chemistry majors), 3) complete the Board of Regents General Education Requirements, 4) satisfactorily complete a course of study at either medical or dental school, and 5) be recommended by the SLU Medical Evaluation Committee. At the beginning of the student's final year of medical or dental school the student must: 1) request that the Medical Evaluation Committee recommend her/him to the head of the Department of Chemistry and Physics for graduation, 2) secure and submit an application for graduation from the Southeastern Louisiana University's Records/Registration Office, and 3) pay the diploma fee at the time the completed application is submitted to the Controller's Office.

A similar program exists for Pre-engineering students. The student must: 1) complete 90 credit hours (the last 30 in residence), 2) complete 20 hours of chemistry above the freshman level including Chem 395 and Clab 391 (all chemistry courses must be chosen from those courses required of chemistry majors) or 28 hours of physics at the 200 level or above (all courses must be chosen from those required of physics majors), 3) complete the Board of Regents General Education Requirements, 4) satisfactorily complete an Engineering Degree Program. At the beginning of the student's final year in the Engineering program, the student must 1) request Departmental evaluation of his/her record, 2) secure and submit an application for graduation, and 3) pay the diploma fee at the time the completed application is submitted to the Controller's Office.

## HONORS DIPLOMA IN CHEMISTRY

For the Honors Diploma in Chemistry, majors must complete the following requirements:

| | |
|---|---|
| English 121H | 3 hours |
| English 122H | 3 hours |
| History 101H | 3 hours |
| History 102H | 3 hours |
| Honors 300 | 1 hours |
| Foreign Language[1] | 12 hours |
| English 291H, English 292H, History 201H, History 202H, GBIO 151H[2] | 3 hours |
| Chemistry 251, 265, 266, 395, 396, 452, 471, 481[3] | 9 hours |
| Chemistry Laboratory 254, 267, 268, 391, 392, 453, 473, 4833 | 3 hours |
| Chemistry 411 | 1 hours |
| Total | 40 hours |

[1] Must be from the same language-6 of these hours will be used from free electives
[2] Any of these courses can be substituted for similar major requirements with the approval of the Department Head
[3] Any one of these courses must be completed as an H-option

## CHEMISTRY SAFETY POLICY

Laboratories are an integral part of all curricula in the Department. A copy of the safety regulations is provided to every student during the first lab class. Any student who violates the safety policy of the Department is subject to dismissal from the laboratory and withdrawal from the course in which the violation occurred. Departmental policy also requires that any student who drops the lecture must also drop the corresponding laboratory.

## PLACEMENT IN CHEMISTRY 121

Students desiring placement in Chemistry 121 must meet at least one of the following conditions.

1. Enhanced ACT mathematics standard score of 21 or higher; or
2. Satisfactory completion of Mathematics 161 or 165; or
3. Satisfactory score on the Departmental Placement Test which is administered during the orientation period; or
4. Consent of Department Head.

## CHEMISTRY

Chemistry is the study of the composition and interaction of all substances. Areas of study range from chemical and instrumental analysis of mixtures to synthesis and characterization of polymers to molecular modeling to the chemistry of the human body and to computational chemistry. The degree program in chemistry at Southeastern is designed to offer the student comprehensive training in modern chemical principles in preparation for a career in industry or the health professions or for graduate study in chemistry or related fields. The study of chemistry is also important for fostering the scientific literacy of students in other disciplines, such as environmental science, law, education, and business.

A Major in Chemistry will be granted upon satisfactory completion of 33-49 credit hours of chemistry.

A Minor in Chemistry will be granted upon satisfactory completion of 21-22 semester hours of chemistry consisting of the following courses: Chemistry 121-123, Chemistry 122-124, Chemistry 251-254 or Chemistry 481-482, Chemistry 265-267, and Chemistry 266-268.

In order to better meet the needs of the diverse student population, four concentration areas are offered in chemistry. They differ primarily in the balance between the number of hours of chemistry and the number of elective hours required. Which one a given student should choose will depend on their career goals. Even if it is not a degree requirement, all students should consider the benefits of their involvement in supervised undergraduate research (Clab 411) sometime during their Junior or Senior years.

**CURRICULUM IN CHEMISTRY**
**LEADING TO THE DEGREE OF BACHELOR OF SCIENCE**

FIRST YEAR

| FIRST SEMESTER | S.H. | SECOND SEMESTER | S.H. |
|---|---|---|---|
| †Chemistry 121 | 3 | †Chemistry 122 | 3 |
| †Chemistry 123 | 1 | †Chemistry 124 | 1 |
| English 101 | 3 | †Chemistry 150 | 2 |
| Math 200[1] | 5 | English 102 | 3 |
| Communications 211 | 3 | Math 201 | 5 |
| Orientation 101 | 0-1 | Biological Sciences | 4 |
| | 15-16 | | 18 |

SECOND YEAR

| | | | |
|---|---|---|---|
| †Chemistry 251 | 3 | †Chemistry 266 | 3 |
| †Chemistry 254 | 2 | †Chemistry 268 | 1 |
| English 230,231,232, or 322 | 3 | Physics 222 | 3 |
| Physics 221 | 3 | Physics 224 | 1 |
| Physics 223 | 1 | Computer Science | 3 |
| †Chemistry 265 | 3 | Arts Elective[2] | 3 |
| †Chemistry 267 | 1 | | |
| | 16 | | 14 |

THIRD YEAR

| | | | |
|---|---|---|---|
| †Chemistry 395 | 3 | English 230,231,232, or 322 | 3 |
| †Chemistry 391 | 1 | Foreign Language[3] | 3 |
| †Chemistry 452 | 3 | Social Science[4] | 3 |
| †Chemistry 453 | 2 | †*Concentration Elect[5] | 3 |
| Foreign Language[3] | 3 | †*Chemistry 396 | 3 |
| Elective | 3 | | |
| | 15 | | 15 |

FOURTH YEAR

| | | | |
|---|---|---|---|
| †*Concentration Elect[5] | 5 | †Chemistry 401 | 1 |
| Social Science[4] | 3 | †*Concentration Elec[5] | 7-8 |
| History | 3 | Electives | 7 |
| Electives | 3 | | |
| | 14 | | 15-16 |

Total semester hours required 122-124

Orientation 101 is not required of transfer or readmitted Southeastern students with 30 hours or more.

[1]Math 162 and Math 165 may be used as electives for those student's whose Math ACT score is insufficient for direct entry into Math 200.
[2]Must be selected from Visual Arts, Music, Theater, or Dance.
[3]Must be selected from the same language.
[4]Must be selected from Economics, Geography, Anthropology, Political Science, Psychology, or Sociology.
[5]Must be selected from one of the four Concentration Areas listed below.
†All Chemistry courses specified above will be used to calculate the major grade point average which must be an adjusted or degree 2.0.
*Only Chemistry courses taken as Concentration Electives will count toward the major GPA.

# CONCENTRATION ELECTIVES

## AMERICAN CHEMICAL SOCIETY CONCENTRATION

(15 HRS REQUIRED)

This Concentration is strongly recommended for those students who may plan to attend graduate school in chemistry.

Students who complete the ACS Certified Curriculum described in this Concentration Area will receive, in addition to their diploma, a certificate from the American Chemical Society.

Students must take:

- Chemistry 471 ..... 3 hrs
- Chemistry 473 ..... 1 hrs
- Chemistry 392 or 485 ..... 1 hrs
- Chemistry 481 ..... 3 hrs
- Chemistry 411 ..... 1 hrs

Any six hours from the following 6 hrs

- Chemistry 482 ..... 3 hrs
- Chemistry 491 ..... 3 hrs
- Chemistry 492 ..... 3 hrs
- Chemistry 462 ..... 3 hrs
- Chemistry 404 ..... 1-3 hrs

## BIOCHEMISTRY CONCENTRATION

(16 HRS REQUIRED)

This Concentration Area is recommended for those students who plan to attend graduate school in biochemistry or who are seeking admission into a program in medicine or dentistry.

Students must take:

- Chemistry 481 ..... 3 hrs
- Chemistry 482 ..... 3 hrs
- Chemistry 485 ..... 1 hrs
- Chemistry 486 ..... 1 hrs
- Chemistry 411 ..... 1 hrs

Any seven hours from the following ..... 7 hrs

- Chemistry 404 ..... 1-3 hrs
- General Biology 200 ..... 3 hrs
- General Biology 312 ..... 3 hrs
- Zoology 392 ..... 4 hrs
- Microbiology 453 ..... 4 hrs

## BUSINESS AND INDUSTRY CONCENTRATION

(REQUIRES 15 HRS)

This concentration Area is recommended for those students who are planning for a career in industry. The non-chemistry courses have been chosen such that they provide support for additional work either in a Master's in Business or training in Occupational Safety and Health.

Students must complete any 15 hours from the following:

- Chemistry 404 ..... 1-3 hrs
- Occupational Safety and Health 122 ..... 3 hrs
- Occupational Safety and Health 123 ..... 3 hrs
- Occupational Safety and Health 125 ..... 3 hrs
- Occupational Safety and Health 221 ..... 3 hrs
- Occupational Safety and Health 223 ..... 3 hrs
- Economics 201 ..... 3 hrs
- Management 231 ..... 3 hrs
- Management 261 ..... 3 hrs
- Management 351 ..... 3 hrs
- Management 309 ..... 3 hrs
- Management 474 ..... 3 hrs
- Accounting 200 ..... 3 hrs
- Marketing 303 ..... 3 hrs

## POLITICAL SCIENCE/PRE-LAW CONCENTRATION

(15 HRS REQUIRED)

This Concentration Area is designed for those students who may wish to enter the fields of environmental or patent law. The electives have been chosen from those recommended for pre-law students.

Students must complete any 15 hours from the following:

| | |
|---|---|
| Chemistry 404 | 1-3 hrs |
| Economics 201 | 3 hrs |
| Accounting 200 | 3 hrs |
| English 321 | 3 hrs |
| Philosophy 313 | 3 hrs |
| Management 232 | 3 hrs |
| Political Science 201 | 3 hrs |
| Political Science 202 | 3 hrs |
| Political Science 401 | 3 hrs |
| Political Science 406 | 3 hrs |
| Political Science 436 | 3 hrs |

# PHYSICS

The notion that the physical universe behaves in a coherent fashion which can be described and predicted mathematically is the fundamental premise of physics. Physicists investigate everything from galaxies to atoms. With current topics such as cold fusion and superconductivity, physics is a vital, vibrant branch of science. The degree program in Physics is designed to offer comprehensive training in modern Physics in preparation for a career in industry, Political Science research, or for further study in Physics, engineering, or related fields.

A major in Physics in the College of Arts and Sciences will be given upon satisfactory completion of 45 semester hours of Physics.

A minor in physics will be granted upon satisfactory completion of 20 semester hours in physics at the 200 level or above, eight hours of which must be Physics 221-223 and Physics 222-224.

### CURRICULUM IN PHYSICS
### LEADING TO THE BACHELOR OF SCIENCE DEGREE

FIRST YEAR

| FIRST SEMESTER | S.H. | SECOND SEMESTER | S.H. |
|---|---|---|---|
| Chemistry 121 | 3 | Chemistry 122 | 3 |
| Chemistry 123 | 1 | Chemistry 124 | 1 |
| English 101 | 3 | English 102 | 3 |
| Math 200[1] | 5 | Math 201 | 5 |
| Computer Science 161 | 3 | Physics 221 | 3 |
| Orientation | 0-1 | Physics 223 | 1 |
| †Physics 130 | 1 | | |
| | 16-17 | | 16 |

SECOND YEAR

| | | | |
|---|---|---|---|
| †Physics 222 | 3 | †Physics 301 | 3 |
| †Physics 224 | 1 | †Physics 303 | 1 |
| †Physics 321 | 3 | †Physics 351 | 3 |
| Math 312 | 3 | Computer Science 261 | 3 |
| English 230, 231, 232 or 322 | 3 | Communications 211 | 3 |
| | | History 201 or 202 | 3 |
| | 13 | | 16 |

THIRD YEAR

| | | | |
|---|---|---|---|
| †Physics 332 | 3 | †Physics 402 | 3 |
| †Physics 312 | 3 | †Physics 425 | 2 |
| †Physics 314 | 1 | Foreign Language 102[3] | 3 |
| Math 350 | 3 | Biological Science | 4 |
| Social Science[2] | 3 | Social Science[2] | 3 |
| Foreign Language 101[3] | 3 | | |
| | 16 | | 15 |

FOURTH YEAR

| | | | |
|---|---|---|---|
| †Physics 331 | 3 | †Physics 422 | 3 |
| †Physics 411 | 1 | †Physics 401 | 3 |
| †Physics 421 | 3 | †Physics 412 | 1 |
| Arts Elective[4] | 3 | Electives | 6 |
| Electives | 6 | Electives | 6 |
| | 16 | | 13 |

Total Semester Hours 121-122 hrs

Orientation 101 is not required of transfer or readmitted Southeastern students with 30 hours or more.

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[1]Math 165 and Math 162 may be used as electives for those students who must take them before entering Math 200.
[2]Must be selected from Economics, Geography, Anthropology, Political Science, Psychology, or Sociology.
[3]Must be selected from the same language.
[4]Must be selected from Visual Arts, Music, Theater, or Dance.
†All courses labeled with this symbol will be used to calculate the major grade point average which must be an adjusted or degree 2.0 average.
*Extended Option: Secondary Education Certification: See College of Education section, this catalog.

## HONORS DIPLOMA IN PHYSICS

For the Honors Diploma in Physics, majors must complete the following requirements:

English 121H.....3 hours
English 122H.....3 hours
History 101H .....3 hours
History 102H .....3 hours
Honors 300.....1 hour
Foreign Language[1].....12 hours
English 291H, English 292H, History 201H, History 202H, GBIO 151H[2]3 hours
Physics 301, 312, 321, 331, 351, 401, 402, 421, 422[2] .....9 hours
Physics Laboratory 303, 314, 425[3].....3 hours
Physics 411.....1 hours
Total .....40 hours

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[1] Must be from the same language-6 of these hours will be used from free electives
[2] Any of these courses can be substituted for similar major requirements with the approval of the Department Head
[3] Any one of these courses must be completed as an H-option