Changes and Additions to Majors, Minors, and Programs

The majors, minors and programs listed below have been added to the curriculum or have had their requirements changed in some way since the publication of the 2007-2009 Undergraduate Bulletin. (Entries are arranged alphabetically by name of program.)

When requirements change, students who have completed at least 45 credits may elect to satisfy either the previous major requirements or the new major requirements. Students with fewer than 45 credits must satisfy the new requirements, unless the major department specifies otherwise. Please consult the section "When Major Requirements Change" in the Academic Policies and Regulations chapter of the Bulletin for complete details.

This list is continually being updated. Twice during the year (roughly November 1 and April 1) the entire Bulletin (including this Supplement) is archived. That is, a "snapshot" of the Bulletin is taken and saved for reference. These dated archives serve as official records of the Bulletin as it changes semester by semester.

Astronomy/Planetary Sciences
Biochemistry
Biology
Biomedical Engineering
Business Management
Chemical and Molecular Engineering
Computer Engineering
Dance
Electrical Engineering
Environmental Engineering
Environmental Studies
Linguistics
Marine Sciences
Marine Sciences Research Center
Marine Vertebrate Biology
Mechanical Engineering
Pharmacology
Physics
Psychology
Technological Systems Management
Astronomy/Planetary Sciences (AST)

A. Required Departmental Courses:
1. AST 203 Astronomy
2. AST 341 Stars and Radiation
3. AST 346 Galaxies
4. AST 347 Cosmology
5. AST/PHY 277 Computation for Physics and Astronomy

2. At least six credits from additional AST courses numbered 203 or higher (except AST 248, 277, 301, 304, and 475). Up to three credits of AST 287, 447, and 487 may be used toward this requirement.

Biochemistry (BCM)

Freshman Spring Credits
- First Year Seminar 102 1
- D.E.C. A 3
- CHE 132 4
- CHE 134 1
- MAT 125 or 132 3-4
- D.E.C. 3
- Total: 15-16

Sophomore Fall Credits
- BIO 201 or 202 3
- CHE 321 4
- MAT 127 (if MAT 125, 126, 127 sequence taken) 3
- BIO 204 2
- D.E.C. 3
- Total: 15

Sophomore Spring Credits
- BIO 203 3
- CHE 326 4
- CHE 327 2
- BIO 205 2
- D.E.C. 3
- Total: 14

Requirements for the Major in Biochemistry

B. Core Courses in Biology
1. BIO 150 The Living World (See Note 1)
2. BIO 201, 202, 203 Fundamentals of Biology (See Note 2)
3. BIO 204 and 205 Fundamentals of Scientific Inquiry in the Biological Sciences I and II

Notes:
1. All students with a high school Biology course and a math placement score of 3 or better receive a waiver of BIO 150 The Living World. A waiver of BIO 150 does not count toward the minimum 33 credits in Requirements A and C.
2. Requests for waivers of major requirements must be approved by the Undergraduate Biology Studies Committee. Biology majors must meet the major requirements of the bulletin of their latest matriculation date.
3. Up to six credits of electives may be chosen from a list of courses offered outside the department; see the Undergraduate Biology Office for the current list.
4. Students having completed one or fewer of BIO 201, 202, 203 prior to Fall 2007 must complete BIO 204 and 205; Students having completed two or more of BIO 201, 202, 203 prior to Fall 2007 are exempt from completing BIO 204 AND BIO 205.

Requirements for the Minor in Biology (BIO)

Completion of the minor requires at least 20 credits in those biology courses designed for the Biology major, including:

A. Two of the following courses:
- BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I and II
- BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II

B. At least six credits of electives may be chosen from a list of courses offered outside the department; see the Undergraduate Biology Office for the current list.
4. Students having completed one or fewer of BIO 201, 202, 203 prior to Fall 2007 must complete BIO 204 and 205; Students having completed two or more of BIO 201, 202, 203 prior to Fall 2007 are exempt from completing BIO 204 AND BIO 205.

Biology (BIO)

Freshman Spring Credits
- First Year Seminar 102 1
- D.E.C. A 3
- CHE 132 4
- BIO 203 3
- CHE 134 1
- MAT 126 3
- D.E.C. 3
- Total: 18

Sophomore Fall Credits
- CHE 321 4
- AMS 110 3
- BIO 201 and BIO 204 5
- D.E.C. 3
- Total: 18

Sophomore Spring Credits
- CHE 322 or 326 4
- CHE 327 2
- BIO 202 and BIO 205 5
- D.E.C. 3
- Total: 17

Junior Fall Credits
- PHY 121/123 4
- BIO 201 3
- BIO Area 3
- D.E.C. 3
- Upper-Division elective 3
- Total: 16

Requirements for the Major in Biology (BIO)

A. Biology Core
1. BIO 150 The Living World (See Note 1)
2. BIO 201, 202, 203 Fundamentals of Biology (See Note 2)
3. BIO 204 and 205 Fundamentals of Scientific Inquiry in the Biological Sciences I and II

Notes:
1. All students with a high school Biology course and a math placement score of 3 or better receive a waiver of BIO 150 The Living World. A waiver of BIO 150 does not count toward the minimum 33 credits in Requirements A and C.
2. Requests for waivers of major requirements must be approved by the Undergraduate Biology Studies Committee. Biology majors must meet the major requirements of the bulletin of their latest matriculation date.
3. Up to six credits of electives may be chosen from a list of courses offered outside the department;
Biomedical Engineering (BME)

Sophomore Fall Credits
AMS 261 4
MEC 260 3
BIO 262 3
D.E.C. 3
AMS 210 3
Total 16

Business Management (BUS)

Requirements for the Major in Business Management (BUS)
The major in Business Management leads to the Bachelor of Science degree. Completion of the major requires approximately 67 credits (including 21 credits for the minor requirement).

A. Core Courses

BUS 115 Introduction to Business for Business Majors
BUS 210 Financial Accounting
BUS 215 Introduction to Business Statistics (see Note)
BUS 220 Introduction to Decision Sciences (formerly Management Science) (see Note)
BUS 330 Principles of Finance or ECO 389 Corporate Finance
BUS 346 Operations Management
BUS 347 Business Ethics
BUS 348 Principles of Marketing
BUS 441 Business Strategy or BUS 353 Entrepreneurship
ECO 108 Introduction to Economics (see Note)

Note:
MAT 122—Overview of Calculus with Applications satisfies DEC C and must be completed as a prerequisite for ECO 108, BUS 215 and BUS 220.

B. Business Electives

One from the following:
BUS 301 Corporate Communications
BUS 340 Information Systems in Management
BUS 351 Human Resource Management
BUS 352 Electronic Commerce
BUS 354 Understanding Business Agreements

BUS 390 Special Topics in Management
BUS 391 Management of Sports Organizations
BUS 401 Negotiations Workshop
BUS 440 International Management
POL 319 Business Law

D. Upper-Division Writing Requirement

BUS 347 – Business Ethics, contains the necessary writing components which satisfy the Upper Division Writing Requirement for the business major. This requirement is effective for those students who are accepted to the business major in the fall 2007 semester and subsequent.

Freshman Spring Credits
First Year Seminar 102 1
WRT 102 or D.E.C. 3
BUS 115 3
BUS 215 3
ECO 108 4
D.E.C. 3
Total 17

Junior Fall Credits
BUS 347 3
Specialization course 3
Minor course 3
Minor course 3
Upper-Division D.E.C. 3
Total 15

Spring Credits
Specialization course 3
BUS Mgmt. elective 3
Minor course 3
Minor course 3
Upper-Division D.E.C. 3
Total 15

The Honors Program in Business Management

The honors program in Business Management is oriented toward research. For admission to the program, students must be BUS majors with junior standing and have earned a cumulative g.p.a. of at least 3.30 through the spring semester of their sophomore year. Three BUS courses, BUS 110 or BUS 115, 210, and 220, must have been completed with a cumulative g.p.a. of at least 3.30. Qualified students must submit an essay describing innovative ideas for business research and a letter of recommendation from a faculty member. They will be interviewed to assess motivation to pursue the honors program curriculum, which includes a research methods course taken in the junior year and a two-semester honors research project and paper completed in the senior year. Students must maintain a 3.00 cumulative g.p.a. to remain in the program, but conferral of honors is contingent upon completion of all required courses with a g.p.a. of 3.50 or higher, both overall and in business management courses.

Requirements for the Minor in Business Management (BUS)
The Business Management minor is intended for students pursuing other majors who seek a foundation in business studies. The minor complements their chosen major by introducing them to principles and techniques used in business and management.

The minor can be completed with 21 to 22 credits, assuming the appropriate prerequisite courses have been taken. All courses must be taken for a letter grade.

1. BUS 111 Introduction to Business for Non-Business Majors
2. Two courses from the following:
   BUS 215 Introduction to Business Statistics
   BUS 220 Introduction to Decision Sciences (formerly Management Science)
   ECO 108 Introduction to Economics
3. Three courses from the following:
   BUS 210 Financial Accounting
   BUS 340 Information Systems in Management
   BUS 346 Operations Management
   BUS 348 Principles of Marketing
   BUS 351 Human Resource Management
4. BUS 441 Business Strategy
Chemical and Molecular Engineering (CME)

Program Educational Objectives
The undergraduate program in chemical and molecular engineering has the following four specific program educational objectives:

1. Provide students with an in-depth knowledge of the basic physical sciences, mathematical techniques, and computational tools that form the foundation of modern chemical and molecular engineering.
2. Educate students to operate effectively as part of a coordinated team, which requires good communication skills (written and oral); leadership and mentoring skills; the ability to provide original contributions that build upon and enhance the group effort; and a strong commitment to upholding ethical and moral standards of intellectual property.
3. Train students to meet the constantly emerging needs of the profession by being well prepared and committed to a lifetime of continuous learning.
4. Give students a sense of workplace relevance by integrating classroom instruction with research, management, and industrial experience.

Acceptance into the Major in Chemical and Molecular Engineering
Freshman and transfer applicants who have specified their interest in the major in Chemical and Molecular Engineering may be accepted directly into the major upon admission to the University. Applicants admitted to the University but not immediately accepted into the Chemical and Molecular Engineering major may apply for acceptance at any time during the academic year by contacting the director of the undergraduate program. Final decisions on admission will be made by the undergraduate program director. Minimum requirements for acceptance are as follows:

1. Students who have completed any of the math, physics, and chemistry required classes from the CME grid with grades of B or better,
2. Students must have an overall g.p.a. of 3.0 with not more than one grade of C or lower in any course, unless permission to waive is granted by the undergraduate program director.
3. Department must receive completed course evaluations for all transferred courses that are to be used to meet requirements of the major.

Major Requirements

5. Chemical Engineering

CME 101 Introduction to Chemical and Molecular Engineering
CME 304, 314 Chemical Engineering Thermodynamics I, II
CME 312 Material and Energy Balance
CME 315 Numerical Methods and Statistical Analysis
CME 327 Molecular Modeling for Chemical Engineers
or 300-level BUS course
CME 318 Chemical Engineering Fluid Mechanics
CME 322 Chemical Engineering Heat and Mass Transfer
CME 323 Reaction Engineering and Chemical Kinetics
CME 401, 402 Separation Technologies I, II
CME 310, 320, 410, 420 Chemical Engineering Laboratory I, II, III, IV
CME 440, 441 Process Engineering and Design I, II

Specializations

A. Pharmacology
Ensures a sound background in pharmacology coupled with a foundation in chemical process control, distillation, and molecular modeling for students interested in pursuing a career in the food, cosmetics, or pharmaceutical industries or in medical instrumentation.
BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
BIO 328 Mammalian Physiology
BCP 401 Principles of Pharmacology
BCP 402 Advanced Pharmacology

F. Custom Specialization
This category is created to allow students to choose their own specialization. Students will select four upper level courses related to the chosen specialty within the courses offered at the university and approved by the CME undergraduate program director. The goal is to provide a basic foundation for students and prepare them for the job market in the chosen specialty.

Computer Engineering (ECE)

Junior Year Spring

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<th>Course Code</th>
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<td>ESE 382#</td>
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<td>ESE 306</td>
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</tr>
<tr>
<td>ESE xxx#</td>
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<tr>
<td>CSE 219</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
</tr>
</tbody>
</table>

2. Natural Sciences

PHY 131/133, 132/134 Classical Physics I, II and laboratories
CHE 131 General Chemistry I and laboratory
Note: The physics course sequence PHY 125, 126, 127 or 141, 142 is accepted in lieu of PHY 131/133, 132/134. (Students are advised to take PHY 127 before PHY 126.) CHE 141/143 or ESG 198 are accepted in lieu of CHE 131/133.

Dance (DAN)
The minor in Dance has been suspended effective fall 2007.

Fall 2007: updates since Spring 2007 are in red
Electrical Engineering (ESE)

2. Natural Sciences

PHY 131/133, 132/134 Classical
Physics I, II and Laboratories
CHE 131 General Chemistry I and
Laboratory

Note: The physics course sequence
PHY 125, 126, 127 or 141, 142 is
accepted in lieu of PHY 131/133,
132/134. (Students are advised to
take PHY 127 before PHY 126.)
The chemistry course sequence
CHE 141 and 143 or ESG 198 are
accepted in lieu of CHE 131 and 133.

Engineering Science (ESG)

B. Engineering Specialization and
Technical Electives

The area of specialization, composed of
two design-oriented courses, (or
four electives plus the upper-division
prerequisite in electrical engineering,
ESE 372, or mechanical engineering,
MEC 363) must be declared in writing
by the end of the junior year. It is se-
lected in consultation with a faculty
advisor to ensure a cohesive course
sequence with depth at the upper level.

The eight areas of specialization are:
biomedical engineering, civil and
environmental engineering, electrical
engineering, materials science and
engineering, mechanical and manufac-
turing engineering, nanoscale engi-
neering, engineering management,
and engineering research. The engi-
neering research specialization
requires: 1) a g.p.a. of at least 3.00, 2)
a letter of intent from the
student that indicates a particular
area of research, and 3) permission of
the undergraduate program director.

Environmental Engineering
(ENE)

Environmental engineering is the appli-
cation of science and engineering prin-
ciples to improving the environment (air,
water, and/or land resources), to provid-
ing healthful water, air and land for
human habitation and for other organ-
isms, and to investigate the possibilities
for remediation of polluted sites.

Environmental engineering also involves
design and application of technology,
including development of new materials,
in support of the principles of sustain-
ability and green manufacturing. The
coursework of the Minor emphasizes the
chemical mechanisms at work behind
environmental processes which govern
production and transport of pollutants,
and design of remediation and pollution
prevention methodologies. The Minor also
provides coursework on materials and
technology development for sustainable
development and manufacturing.

The Minor in Environmental
Engineering is composed of the following
courses:

A. Two required courses:
- ESM 212: Introduction to
  Environmental Materials
  Engineering
- One course selected from CHE 312:
  Physical Chemistry, short course or
  CHE 301: Physical Chemistry I

B. Technical electives (choose 4, of which
   at least 1 must be an ESG or ESM
   course):
- ESG 301: Sustainability of the Long
  Island Pine Barrens
- ESG 320: Sensor Materials and
  Devices
- ESG 332: Materials Science I:
  Structure and Properties of Materials
- ESM 334: Materials Engineering
- ESM 488 Cooperative Industrial
  Practice or 499 Research in Materials
  Science or ESG 487 Cooperative
  Research in Technological Solutions:
  at least 3 credits, with permission of
  Director of the Minor.
- BIO 386/ENS 311: Ecosystem
  Ecology and the Global Environment
- CHE 302: Physical Chemistry II
- GEO 315: Groundwater Hydrology
- GEO 316: Geochemistry of Surficial
  Processes
- GEO 318: Engineering Geology and
  Coastal Processes
- MAR 301: Environmental
  Microbiology
- MAR 336: Marine Pollution
- MAR 392: Waste Management Issues
- MAR 394: Environmental Toxicology
  and Public Health
- ATM 397: Air Pollution and Its
  Control
- CHE 310: Chemistry in Technology
  and the Environment

Note: Students in the College of Arts
and Sciences (but not CEAS majors)
may also use
- ESG 302: Thermodynamics of
  Materials
- or
- CME 304: Chemical Engineering
  Thermodynamics I

as a technical elective for the Minor in
Environmental Engineering.

Any substitution of a course outside this
list for a technical elective requires the
permission of the director of the minor
prior to registering for the desired
course.
### Environmental Studies (ENS)

**Requirements for the Major in Environmental Studies (ENS)**

**A. Foundation Courses (34 credits)**

1. **Natural Sciences**
   - BIO 201 Fundamentals of Biology: Organisms to Ecosystems
   - BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I
   - CHE 131, 133 General Chemistry and Lab (See Note 1)
   - MAT 125 or MAT 131 or MAT 141 Calculus
   - PHY/ENS 119 Physics for Environmental Studies (See Note 2)
   - One of the following:
     - GEO 101 Environmental Geology
     - MAR 104 Oceanography
     - ATM 102 Weather and Climate
     - ENS 101 Prospects for Planet Earth

2. **Social Sciences**
   - ANP 120 Introduction to Physical Anthropology
   - ECO 108 Introduction to Economic Analysis
   - POL 102 Introduction to American Government

3. **Humanities**
   - PHI 104 Moral Reasoning or PHI 105 Politics and Society

4. **Communications**
   - Proficiency in writing, oral communication, and computer literacy will be encouraged in all students. These skills will be developed within the context of formal coursework and no additional credits are required.

5. **Upper-Division Writing Requirement**
   - All students in the major must submit two papers from any upper division course in the major to the Director of Undergraduate Programs for evaluation by the end of the junior year.

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<thead>
<tr>
<th>Sophomore Fall</th>
<th>Credits</th>
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<tr>
<td>AMS 110 or other statistics</td>
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<td>D.E.C.</td>
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<td>D.E.C.</td>
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<td>Elective</td>
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<th>Junior Fall</th>
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<tr>
<td>BIO 201 and 204</td>
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<tr>
<td>MAR 340</td>
<td>3</td>
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<tr>
<td>PHY 119</td>
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</table>

**B. Concentration (12 credits)**

All students in the major must complete an area of concentration consisting of four courses to develop depth of knowledge in a specific field of interest.

9. **Public Policy**
   - POL 325 Civil Liberties and Civil Rights
   - POL 359 Public Policy Analysis
   - POL 364 Organizational Decision Making
   - POL 365 Government Regulation of Business
   - PHI 364 Philosophy of Technology or PHI 366 Philosophy and the Environment
   - One additional upper-division waste reduction or environmental policy course (with permission of the undergraduate director)

**Linguistics (LIN)**

**Honors Program**

Linguistics majors who have maintained a G.P.A. of 3.50 in the major are eligible to graduate with departmental honors. An additional requirement for honors is the submission of a senior thesis based on research performed during the senior year. Students must submit a written thesis proposal for approval to a sponsoring faculty member in the semester prior to the start of their senior year. Acceptance into the honors program depends on approval of the proposal by the sponsoring faculty member, the director of undergraduate studies and the department.

LIN 495 and LIN 496 will be taken as a two semester sequence during the senior year; for a total of six credits. Students will receive only one grade upon completion of the sequence. These courses must be taken in addition to the total credits required for the major. The student’s thesis must be completed and submitted no later than 3 weeks prior to the end of the semester in which they are enrolled in LIN 496. The thesis will be read and evaluated by a committee consisting of the student’s sponsor, one other member of the Department of Linguistics, and one faculty member from another department, as arranged by the director of undergraduate studies.

If the thesis is accepted by the committee and the student retains a 3.50 G.P.A. for all linguistics courses taken, the department will recommend that honors be conferred.

<table>
<thead>
<tr>
<th>Sophomore Fall</th>
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<tr>
<td>LIN 307#@</td>
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<tr>
<td>LIN 201*#</td>
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</tr>
<tr>
<td>LIN 345@</td>
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<tr>
<td>Foreign language 211*</td>
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<tr>
<td>LIN 330@</td>
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<td>LIN 301*#</td>
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<tr>
<td>Foreign language 212*</td>
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<tr>
<td>LIN 355@</td>
<td>3</td>
</tr>
<tr>
<td>LIN 345@</td>
<td>3</td>
</tr>
<tr>
<td>LIN 211*#</td>
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<tr>
<td>D.E.C.</td>
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<tr>
<td>SSE 327#</td>
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<td>LIN 300*#</td>
<td>1</td>
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<td>LIN 375@#</td>
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<td>LIN 445@#</td>
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<td>SSE 350@</td>
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<td>Upper-Division Elective</td>
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* Course must be taken for the major.
# Course must be taken for certification.
@ Course fulfills the major requirement but is not obligatory.

**Sample Course Sequence for the Major in Linguistics**

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<tr>
<th>Freshman Fall</th>
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<tr>
<td>First Year Seminar 101</td>
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<td>LIN 101</td>
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<td>Foreign language 111</td>
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<td>Foreign language 112</td>
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<td>D.E.C.</td>
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### Sophomore Fall Credits

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<td>LIN 307</td>
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<td>LIN 201</td>
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<td>LIN 345</td>
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<td>Foreign language 211</td>
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<td>D.E.C.</td>
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<td><strong>Total</strong></td>
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### Spring Credits

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<td>LIN 330</td>
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<td>Foreign language 212</td>
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### Junior Fall Credits

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<td>Upper-Division Elective</td>
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### Spring Credits

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</tr>
<tr>
<td>Upper-Division Elective</td>
<td>9</td>
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<tr>
<td><strong>Total</strong></td>
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</tbody>
</table>

### Senior Fall Credits

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>LIN 425</td>
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</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>Upper-Division Elective</td>
<td>3</td>
</tr>
<tr>
<td>Upper-Division Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
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### Spring Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>LIN 426</td>
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<td>Upper-Division Electives</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

---

### Marine Sciences (MAR)

#### Requirements for the Major in Marine Sciences (MAR)

1. **Foundation Courses (41-42 credits)**
   - BIO 201 Organisms to Ecosystems
   - BIO 202 Molecular and Cellular Biology
   - BIO 203 Cellular and Organ Physiology
   - BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I
   - BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II
   - CHE 131/133, 132/134 General Chemistry and Lab (see Note 1)
   - CHE 321 Organic Chemistry
   - MAT 125, 126 Calculus (see Note 2)
   - ENS/PHY 119 Physics for Environmental Studies or PHY 121/123 Physics for Life Sciences with lab (see Note 3)
   - AMS 102 or AMS 110 Statistics

#### Freshman Spring Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Seminar 102</td>
<td>1</td>
</tr>
<tr>
<td>D.E.C. A</td>
<td>3</td>
</tr>
<tr>
<td>CHE 132</td>
<td>4</td>
</tr>
<tr>
<td>CHE 124</td>
<td>1</td>
</tr>
<tr>
<td>MAT 126</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Fall Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 201 and 204</td>
<td>5</td>
</tr>
<tr>
<td>AMS 110</td>
<td>3</td>
</tr>
<tr>
<td>CHE 321</td>
<td>4</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
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</table>

#### Sophomore Spring Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 203 and 205</td>
<td>5</td>
</tr>
<tr>
<td>MAR elective</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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</table>

#### Junior Fall Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 202</td>
<td>3</td>
</tr>
<tr>
<td>MAR 349</td>
<td>4</td>
</tr>
<tr>
<td>ENS/PHY 119</td>
<td>4</td>
</tr>
<tr>
<td>Upper-Division D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

---

### Marine Sciences Research Center (MSRC)

Effective fall 2007, the education and research programs in marine and atmospheric sciences will become known as the “School of Marine and Atmospheric Sciences” (SoMAS). The Marine Sciences Research Center will continue but will be nested within the school along with other research institutes.

### Marine Vertebrate Biology (MVB)

#### Requirements for the Major in Marine Vertebrate Biology (MVB)

1. **Foundation Courses (43-46 credits)**
   - BIO 201 Organisms to Ecosystems
   - BIO 202 Molecular and Cellular Biology
   - BIO 203 Cellular and Organ Physiology
   - BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I
   - BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II
   - CHE 131/133, 132/134 General Chemistry and Lab (see Note 1)
   - CHE 321 Organic Chemistry
   - MAT 125, 126 Calculus (see Note 2)
   - ENS/PHY 119 Physics for Environmental Studies or PHY 121/123 Physics for Life Sciences with lab (see Note 3)
   - AMS 102 or AMS 110 Statistics

#### Freshman Spring Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Seminar 102</td>
<td>1</td>
</tr>
<tr>
<td>D.E.C. A</td>
<td>3</td>
</tr>
<tr>
<td>CHE 132</td>
<td>4</td>
</tr>
<tr>
<td>CHE 124</td>
<td>1</td>
</tr>
<tr>
<td>MAT 126</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
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#### Sophomore Fall Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 201 and BIO 204</td>
<td>5</td>
</tr>
<tr>
<td>AMS 110</td>
<td>3</td>
</tr>
<tr>
<td>CHE 321</td>
<td>4</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
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#### Sophomore Spring Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 203 and BIO 205</td>
<td>5</td>
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<tr>
<td>MAR elective</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
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<tr>
<td><strong>Total</strong></td>
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#### Junior Fall Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 202</td>
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<td>MAR 349</td>
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</tr>
<tr>
<td>ENS/PHY 119</td>
<td>4</td>
</tr>
<tr>
<td>Upper-Division D.E.C.</td>
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<tr>
<td><strong>Total</strong></td>
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http://www.stonybrook.edu/ubulletin
<table>
<thead>
<tr>
<th>Junior Spring</th>
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<tbody>
<tr>
<td>BIO 203</td>
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<td>BIO 354</td>
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<td>2</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Upper-Division D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

**Junior Spring Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 203</td>
<td>3</td>
</tr>
<tr>
<td>BIO 354</td>
<td>3</td>
</tr>
<tr>
<td>MEC 202</td>
<td>2</td>
</tr>
<tr>
<td>MEC 262</td>
<td>3</td>
</tr>
<tr>
<td>MEC 363</td>
<td>3</td>
</tr>
<tr>
<td>AMS 361 or MAT 303</td>
<td>4</td>
</tr>
<tr>
<td>ESG 198 or CHE 131</td>
<td>4</td>
</tr>
<tr>
<td>MEC 214</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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**Junior Fall Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MEC 301</td>
<td>3</td>
</tr>
<tr>
<td>ESG 332</td>
<td>4</td>
</tr>
<tr>
<td>MEC 316</td>
<td>3</td>
</tr>
<tr>
<td>MEC 364</td>
<td>3</td>
</tr>
<tr>
<td>EST 392 (D.E.C. F)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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**Junior Spring Credits**

<table>
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<tr>
<th>Course</th>
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<tbody>
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<td>MEC 305</td>
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<td>MEC 310</td>
<td>3</td>
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<tr>
<td>MEC 317</td>
<td>2</td>
</tr>
<tr>
<td>MEC 320</td>
<td>3</td>
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<td>MEC 125</td>
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<td>MEC 325</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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</table>

**Fall 2007: updates since Spring 2007 are in red**

**Mechanical Engineering (MEC)**

**Sophomore Spring Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MEC 203</td>
<td>2</td>
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<tr>
<td>MEC 262</td>
<td>3</td>
</tr>
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<td>MEC 363</td>
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</tr>
<tr>
<td>AMS 361 or MAT 303</td>
<td>4</td>
</tr>
<tr>
<td>ESG 198 or CHE 131</td>
<td>4</td>
</tr>
<tr>
<td>MEC 214</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
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**Junior Fall Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEC 301</td>
<td>3</td>
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<tr>
<td>ESG 332</td>
<td>4</td>
</tr>
<tr>
<td>MEC 316</td>
<td>3</td>
</tr>
<tr>
<td>MEC 364</td>
<td>3</td>
</tr>
<tr>
<td>EST 392 (D.E.C. F)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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</tbody>
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**Sophomore Fall Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 321</td>
<td>4</td>
</tr>
<tr>
<td>BIO 202 and BIO 204</td>
<td>5</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
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<td><strong>18</strong></td>
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</table>

**Sophomore Spring Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 203 and BIO 205</td>
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<tr>
<td>CHE 322</td>
<td>4</td>
</tr>
<tr>
<td>CHE 327</td>
<td>2</td>
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<td>D.E.C.</td>
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<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

**Pharmacology (BCP)**

**Requirements for the Major in Pharmacology (BCP)**

1. BIO 202 and 203 Fundamentals of Biology
2. BIO 204 and 205 Fundamentals of Scientific Inquiry I and II
3. BIO 310 Cell Biology
4. HBY 350 Physiology (BIO 328 will be allowed as a substitute under extenuating circumstances.)
5. BIO 361, 362 Biochemistry I, II
6. BIO 365 or BIO 311 Biochemistry Laboratory

**Sophomore Fall Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 321</td>
<td>4</td>
</tr>
<tr>
<td>BIO 202 and BIO 204</td>
<td>5</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

**Sophomore Spring Credits**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 203 and BIO 205</td>
<td>5</td>
</tr>
<tr>
<td>CHE 322</td>
<td>4</td>
</tr>
<tr>
<td>CHE 327</td>
<td>2</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>4</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>
### Physics (PHY)

**Requirements for the Major in Physics (PHY)**

The major in Physics leads to the Bachelor of Science degree. Each course used to satisfy the major numbered 300 or above must be completed with a grade of C or higher; a maximum of three courses at the 100 or 200 level passed with a grade of C- may be applied to the major. Completion of the major requires approximately 67 credits.

**Specialization in Optics**

Students majoring in Physics may decide to pursue a specialization in Optics. This specialization is listed on the official transcript.

Students must complete the following courses with a grade of C or better to satisfy the requirements for the specialization:

<table>
<thead>
<tr>
<th>A. Required Departmental Courses (12 credits)</th>
<th>B. Optics-related laboratory experience</th>
<th>C. One additional elective course:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 301 Electricity and Magnetism I</td>
<td>PHY 487 Research (at least 3 credits-optics related)</td>
<td>Either PHY 405 Quantum Mechanics II, or</td>
</tr>
<tr>
<td>PHY 302 Electricity and Magnetism II</td>
<td></td>
<td>One of many courses in other departments and also in the College of Engineering and Applied Sciences (CEAS) that could meet the requirements for this additional elective. Advance approval of such courses must be obtained from the Director of Undergraduate Studies. Examples of such courses in the CEAS are: ESE-340, (Communication Theory); ESE-357 (Digital Image Processing); ESE-358 (Computer Vision); ESE-362 (Opto-electronic Devices); ESE-363 (Fiber Optic Communications); and ESM-325 (Diffraction Techniques).</td>
</tr>
</tbody>
</table>

### Psychology (PSY)

**Sample Course Sequence for the Major in Psychology (B.S. Degree)**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Seminar 102</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>D.E.C. A</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSY Group A (220 or 230 or 240) OR PSY Group B (250 or 260)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MAT 126 or 132 or 142</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16-17</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore</th>
<th>Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 201**</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PSY Group B (if Group A taken)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIO 201, 202, or 203, and 204</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
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<table>
<thead>
<tr>
<th>Sophomore</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 310</td>
<td>4</td>
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<tr>
<td>PSY Group A or B</td>
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<td></td>
</tr>
<tr>
<td>PSY elective***</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIO 201, 202, or 203, and 205</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

### For the B.S. Student

All three categories below are required.

1. **Mathematics:**
   a. MAT 125 and 126; or
   b. MAT 131 and 132; or
   c. MAT 141 and 142; or
   d. AMS 151 and 161; or
   e. Passing the mathematics placement examination at level 8 or higher.

2. **Biology:**
   Two courses from the following:
   BIO 201, 202, and 203
   Note: One course of the two-course requirement is waived if students elect the biology concentration below. Students enrolling in BIO 201, 202, or 203 in the fall 2007 semester and subsequent semesters will be required to take BIO 204 plus 205 (lab components).

### Technological Systems Management (TSM)

**In major course sequence, Junior fall EST 325 changed to EST 326, and in Junior spring EST 327 replaces elective.**

**D. Technological Systems Management**

1. **Required courses (10)**
   - EST 192 Introduction to Modern Engineering
   - EST 194 Patterns of Problem Solving
   - EST 202 Introduction to Science, Technology, and Society Studies
   - EST 305 Applications Software for Information Management
   - EST 326 Management for Engineers
   - EST 327 Marketing for Engineers
   - EST 391 Technology Assessment
   - EST 392 Engineering and Managerial Economics
   - EST 393 Project Management
   - EST 440 Interdisciplinary Research Methods
   - EST 441 Interdisciplinary Senior Project

2. **Electives**
   Three from the following list:
   - EST 303 Crisis Communication
   - EST 304 Communication for Engineers and Scientists
   - EST 320 Communication Technology Systems
   - EST 325 Technology in the Workplace
   - EST 330 Natural Disasters; Societal Impacts and Technological Solutions
   - EST 331 Ethics and Intellectual Property
   - EST 421 Starting the High-Technology Venture

**Requirements for the Minor in Technological Systems Management (TSM)**

All students must complete four required EST courses and two or more EST electives (minimum 18 credits) with a g.p.a. of 2.50 or higher. No grade less than C may be used to meet the requirements for the minor.

EST courses counted toward the requirements for a student's major may not be counted towards the requirements for the TSM minor.

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1. Choose four of these required courses:
   EST 192 Introduction to Modern Engineering
   EST 194 Patterns of Problem Solving
   EST 326 Management for Engineers
   EST 327 Marketing for Engineers
   EST 391 Technology Assessment
   EST 393 Project Management

2. Choose two electives from the following:
   EST 201 Technological Trends in Society
   EST 304 Communication for Engineers and Scientists
   EST 305 Applications Software for Information Management
   EST 320 Communication Technology Systems
   EST 325 Technology in the Workplace
   EST 392 Engineering and Managerial Economics
American Studies
[Effective Spring 2007]
AFS/HIS 388 has been deleted from the American Peoples concentration.

Applied Mathematics and Statistics (AMS)
[Effective Spring 2006]
See change to minor requirements in red. (Previously “two”.)

Requirements for the Minor in Applied Mathematics and Statistics (AMS)
D. AMS electives: three additional 300-level AMS courses
[Effective Spring 2007]

The Combined B.S./M.S. Program in Applied Mathematics and Statistics
The combined B.S./M.S. program in applied math and statistics allows students with superior academic records to use up to nine graduate credits towards both the B.S. and M.S. degree requirements, thus reducing the normal time required to complete both programs to five years (ten semesters). For detailed program requirements, please refer to the Graduate Bulletin.

Art, Studio (ARS)
[Effective Spring 2006]
ARS 390, which is not for major credit, has been removed from the following list:

Requirements for the Major in Studio Art (ARS)
...
6. Thirty-six additional credits...
...
d. Additional Advanced Study: ARS 475, 476, 487, 488, 491, 492, 495
[Effective Spring 2006: ARS 390 was removed from this list]

Astronomy/Planetary Sciences (AST)
[Effective Fall 2005]
AST/PHY 277 was added to the requirements for the major. This also increased the number of credits required for the major. (See red below for both.)

Requirements for the Major in Astronomy/Planetary Sciences (AST)
Completion of the major requires 63-66 credits.
A. Required Departmental Courses:
1. AST 203 Astronomy
   AST 341 Stars and Radiation
   AST 346 Galaxies
   AST 347 Cosmology
   AST/PHY 277 Computation for Physics and Astronomy

Atmospheric and Oceanic Sciences (ATM)
[Effective Fall 2006]
See additions in red below.

Requirements for the Major in Atmospheric and Oceanic Sciences (ATM)
A. Required Courses in Mathematics, Chemistry, Physics, and Computer Science
1. MAT 131 and 132 Calculus I and II
   (See Note below)
2. MAT 203 Calculus III with Applications
   or MAT 205 Calculus III
   or AMS 261 Applied Calculus III
3. CHE 131 General Chemistry I
   or CHE 141 Honors Chemistry I
4. PHY 125, 126, 127 Classical Physics A, B, and C
   or PHY 131/133, 132/134 Classical Physics I and II with labs
   or PHY 141, 142 Classical Physics I and II: Honors
5. PHY 277 Computation for Physics and Astronomy
   or ESG 111 C Programming for Engineers
   or CSE 130 Introduction to Programming in C
B. Required Departmental Courses:
1. ATM 205 Introduction to Atmospheric Sciences
2. ATM 247 Atmospheric Structure and Analysis
3. ATM 345 Atmospheric Thermodynamics and Dynamics
4. ATM 348 Atmospheric Physics
5. ATM 397 Air Pollution and Its Control
6. MAR 334 Remote Sensing
Additional Requirements for the Meteorology Track:

- CHE 132 General Chemistry II (or CHE 142 Honors Chemistry II)
- MAT 303 or MAT 305 Calculus IV with applications (or AMS 361 Applied Calculus)
- ATM 346 Advanced Atmospheric Dynamics
- ATM 347 Advanced Synoptic Meteorology
- PHY 251 Modern Physics (or ATM 320 Spatial Data Analysis Using Matlab)

In this track, students learn both the mathematics and physics governing atmospheric behavior and apply this knowledge to forecasting the weather using real-time data received at our weather laboratory. Opportunities are available for students to gain additional practical experience by working under cooperative agreements at two nearby NOAA weather forecasting installations as well as local TV stations. Students graduating in this track will have satisfied all of the coursework recommended by the American Meteorological Society for undergraduate training in meteorology and also the course work required by NOAA for certification as an entry-level government meteorologist.

Additional Requirements for the Atmosphere/Ocean Track:

- AMS 102 Elements of Statistics
- AMS 394 Statistical Lab (or AMS 210 Linear Algebra)
- ATM 320 Spatial Data Analysis Using Matlab
- MAR 333 Coastal Oceanography
- MAR 340 Environmental Problems and Solutions (or ENS 301 Contemporary Environmental Issues)

This track is not intended for students who are interested in the NOAA/National Weather Service or graduate school in atmospheric science. Rather, students graduating in this track receive a solid background in statistics, atmospheric science, and oceanography and are therefore well qualified for jobs in the private sector (instrument companies, weather and climatology consultants, weather support for major industry such as airlines and utilities, as well as forecast and climate modeling companies). The ocean-related courses also help those students who are interested in the M.S. graduate program in physical oceanography. Students are also prepared for positions in other technically related fields.

Note: The following alternate beginning calculus sequences ...

### Biology (BIO)

[Effective Fall 2006]

See revisions in red below.

#### Requirements for the Major in Biology (BIO)

(...)

#### C. Advanced Courses

Students must complete one of the following specializations using the advanced biology lecture and laboratory courses listed below, and courses offered by related departments where specified:

- Advanced Lecture Courses:
  - BIO 310, 314, 315, 316, 317*, 318*, 361, 362
  - BIO 318*, 320, 325, 339*
  - BIO 317*, 318*, 328, 334, 339*
  - BIO 318*, 320, 325, 334, 339*
  - BIO 310, 314, 315, 316, 317*, 318*, 362
  - BIO 318*, 320, 325, 339*
  - BIO 317*, 318*, 328, 334, 339*
  - BIO 318*, 340, 341, 343, 344, 346, 348, 380, MAR 371
  - BIO 318*, 340, 341, 343, 344, 346, 348, 380, MAR 371
  - BIO 318*, 340, 341, 343, 344, 346, 348, 380, MAR 371

- Advanced Laboratory Courses:
  - BIO 311, 316, 317, 318*
  - BIO 319, 317, 318*
  - BIO 318*, 328, 334, 339*

* BIO 317, 318, and 339 may each be used to satisfy only one area.

- Advanced Laboratory Courses:
  - BIO 311, 316, 317, 318*
  - BIO 319, 317, 318*
  - BIO 318*, 328, 334, 339*

#### 3. Environmental Biology Specialization

- BIO 351 Ecology
- BIO 352, 356, 367, MAR 301, 303, 305, 320

### Bioengineering (BNG)

http://www.stonybrook.edu/ugbulletin
Supplement: Majors, Minors, and Programs

Completion of the major requires approximately 130 credits.

Requirements for the Minor in Bioengineering (BNG)
All courses for the minor must be passed with a letter grade of C or higher.
Completion of the minor requires 19 credits.

A. Required Courses for each Track
1. BME 100 Introduction to Biomedical Engineering
2. ESG 111 C-Programming for Engineers (or equivalent)

B. Specialization Tracks
1. Biomechanics
   a. MEC 260 Engineering Statics
   b. BME 230 Biomechanics
   c. AMS 261 Applied Calculus III (or equivalent)
   d. Either BME 304-H Genetic Engineering or BME 381 Nanofabrication in Biomedical Applications
2. Bioelectricity
   a. ESE 271 Electrical Circuit Analysis I
   b. BME 301 Bioelectricity
   c. AMS 210 Applied Linear Algebra (or equivalent)
   d. BME 313 Bioinstrumentation
3. Molecular/Cellular
   a. BME 304-H Genetic Engineering
   b. BME 381 Nanofabrication in Biomedical Applications
   c. ESG 332 Materials Science I: Structure and Properties of Materials
   d. Either BME 353 (ESM 353) Biomechanics: Manufacture, Properties, and Applications or BME 404 Essentials of Tissue Engineering or BME 430 Engineering Approaches to Drug and Gene Delivery

COURSE DESCRIPTIONS

1. Mathematics
   d. AMS 210 Matrix Methods and Models
   e. AMS 310 Survey of Probability and Statistics
2. Natural Sciences
   a. BIO 150 The Living World
   b. BIO 202 Fundamentals of Biology: Molecular and Cellular Biology or BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
   c. PHY 131/133, 132/134 Classical Physics I, II with labs
   d. Molecular and Cellular Biomedical Engineering

Courses focus on the application of biochemistry, cell biology, and molecular biology (i.e., recombinant DNA methodology) to the broad fields of genetic engineering, biotechnology, bionanotechnology, and biosensors. Includes the specific engineering principles that are applied to problems involving structure and function of molecules and cells in areas such as tissue engineering, gene therapy, microarray, drug design and delivery, structural biology computational methods, and bioinformatics. Students must take both BIO 202 and 203, as well as CHE 321 and 322.

Program Educational Objectives
The undergraduate program in biomedical engineering has the following five specific program educational objectives:

1. Career Preparation: Our graduates will be prepared to excel in bioengineering, bioscience, or medical disciplines in basic and applied research, design, or technology development, representing the fields of academics, government, medicine, law, or industry.
2. Professional Development: Our graduates will emerge as recognized experts in the field of biomedical engineering, and serve in positions of leadership in academics, government, medicine, or industry. Further, our alumni will function successfully as principal members of integrative and interdisciplinary teams.
3. Professional Conduct: Our graduates will hold paramount the health, safety, and welfare of the public, and conduct themselves in a professional and ethical manner at all times. Further, our alumni will communicate effectively to a variety of target audiences through both written and oral media.
4. Societal Contribution: Our graduates will respond and adapt to the scientific and engineering needs of society both nationally and internationally, seek out new opportunities, and contribute to the development of a healthy and globally competitive economy.
5. Life-long Learning: Our graduates will continually build on their undergraduate foundation of science, engineering, and societal understanding, and continue to develop their knowledge, skills, and contributions throughout their professional careers and private lives. This will include active participation in professional societies, attending and making presentations at conferences, and participating in outreach activities within their areas of expertise.

Program Outcomes
To prepare students to meet the above program educational objectives, a set of program outcomes that describes what students should know and be able to do when they graduate, have been adopted. We expect students to gain:

Requirements for the Major in Biomedical Engineering (BME)

Completion of the major requires approximately 130 credits.

[Effective Fall 2006]

The following text in red has been added to the first page, including two new sections enumerating Program Educational Objectives and Program Outcomes:

The Department also offers ...beyond the Bachelor's degree.

Program Educational Objectives
The undergraduate program in biomedical engineering has the following five specific program educational objectives:

1. Career Preparation: Our graduates will be prepared to excel in bioengineering, bioscience, or medical disciplines in basic and applied research, design, or technology development, representing the fields of academics, government, medicine, law, or industry.
2. Professional Development: Our graduates will emerge as recognized experts in the field of biomedical engineering, and serve in positions of leadership in academics, government, medicine, or industry. Further, our alumni will function successfully as principal members of integrative and interdisciplinary teams.
3. Professional Conduct: Our graduates will hold paramount the health, safety, and welfare of the public, and conduct themselves in a professional and ethical manner at all times. Further, our alumni will communicate effectively to a variety of target audiences through both written and oral media.
4. Societal Contribution: Our graduates will respond and adapt to the scientific and engineering needs of society both nationally and internationally, seek out new opportunities, and contribute to the development of a healthy and globally competitive economy.
5. Life-long Learning: Our graduates will continually build on their undergraduate foundation of science, engineering, and societal understanding, and continue to develop their knowledge, skills, and contributions throughout their professional careers and private lives. This will include active participation in professional societies, attending and making presentations at conferences, and participating in outreach activities within their areas of expertise.

Program Outcomes
To prepare students to meet the above program educational objectives, a set of program outcomes that describes what students should know and be able to do when they graduate, have been adopted. We expect students to gain:
a. the ability to apply knowledge of advanced mathematics, science, biology, physiology, biotechnology, and engineering;
b. the ability to design and conduct experiments from living and non-living systems, as well as to analyze and interpret data;
c. the ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
d. the ability to function on multidisciplinary teams;
e. the ability to identify, formulate, and solve problems at the interface of engineering and biology;
f. the understanding of professional and ethical responsibility;
g. the ability to communicate effectively;
h. the broad education necessary to understand the impact of biomedical engineering solutions in a global, economic, environmental, and societal context;
i. the recognition of the need for, and an ability to engage in, life-long learning;
j. a knowledge of contemporary issues; and
k. the ability to use the techniques, skills, and modern engineering tools necessary for addressing the problems associated with the interaction between living and/or non-living materials and systems.

More details about program educational objectives and outcomes can be found at http://bme.sunysb.edu/bme/ugrad/index. html#abet.

See revisions in red below:

Requirements for the Major in Biomedical Engineering (BME)

Completion of the major requires approximately 130 credits.

3. Computers and Programming
   a. ESG 111 C Programming for Engineers
      or MEC 112 Practical C/C++ for Scientists and Engineers
      or ESE 124 Computer Techniques for Electronic Design
      or CSE 130 Introduction to Programming in C

Grading

All courses taken to satisfy 1-6 above must be taken for a letter grade. A grade of C or higher is required in the following courses: AMS 151, 161 or equivalent; BIO 202 or 203; CHE 131, 132 or equivalent; PHY 131/133, 132/134 or equivalent; all BME courses.

Specializations

a. Biomechanics
   Courses that focus on developing an understanding of mechanical structures and dynamics of biological systems. This specialization is appropriate for students interested in the areas of biofluid mechanics, hard and soft tissue biomechanics, biomaterials, medical prosthetics, or bioinstrumentation.

Recommended courses:
- BME 303 Biomechanics
- BME 313 Bioinstrumentation
- ESG 302 Thermodynamics of Materials
- ESM 353 Biomaterials
- MEC 363 Mechanics of Solids

Alternative courses:
- ESE 315 Control System Design

b. Biomaterials
   Recommended courses:
- BME 303 Biomechanics
- BME 313 Bioinstrumentation
- ESM 335 Strength of Materials
- ESM 353 Biomaterials
- ESM 369 Polymers

Alternative courses:
- ESG 281 Engineering Intro to Solid State
- ESM 335 Strength of Materials

Bioelectricity

Recommended courses:
- AMS 210 Applied Linear Algebra
- BME 313 Bioinstrumentation
- BME 461 Biosystems Analysis
- BME 481 Biosensors
- CHE 321 Organic Chemistry
- CSE 377 Introduction to Medical Imaging

Alternative courses:

Molecular and Cellular Biomedical Engineering

Courses focus on the application of biochemistry, cell biology, and molecular biology (i.e., recombinant DNA methodology) to the broad fields of genetic engineering, biotechnology, biomanufacturing, and biosensors. Includes the specific engineering principles that are applied to problems involving structure and function of molecules and cells in areas such as tissue engineering, gene therapy, microarray, drug design and delivery, structural biology computational methods, and...
bioinformatics. Students must take both BIO 202 and 203, as well as CHE 321, 322 and BME 404.

Recommended courses:
(Students should take both BIO 202 and BIO 203.)

BME 313 Bioinstrumentation
BME 381 Nanofabrication in Biomedical Applications
BME 404 Essentials of Tissue Engineering
BME 461 Biosystems Analysis

Alternative courses:
BME 303 Biomechanics

Business Management (BUS)
[Effective Fall 2005]

There have been substantial changes to this major. Please see the revised text below.

The College of Business offers undergraduate students a major and a minor in Business Management. The major program offers students a solid foundation of essential business concepts and applications. In addition to courses in statistics, decision sciences, and general management, students study the fundamentals of four business functions: accounting, finance, marketing or operations. Majors have an opportunity to concentrate in one of these four business functions. The knowledge gained in the concentration assists students to gain employment in that area of a business. Business majors are also required to minor in a discipline outside of business. In addition to providing the student with a broader education, the minor can also provide students with complementary knowledge in their business concentration. Business does not operate in isolation from other disciplines but looks to the arts and sciences for insight into such important business topics as leadership, ethics, consumer behavior, information systems, mathematical models and international relations.

Courses Offered in Business Management
See the Course Descriptions listing in this Bulletin for complete information.

BUS 110 Business in the 21st Century
BUS 210 Financial Accounting
BUS 214 Managerial Accounting
BUS 215 Introduction to Business Statistics
BUS 220 Introduction to Decision Sciences (formerly Management Science)
BUS 300 Writing for Business Management
BUS 301 Corporate Communications
BUS 310 Intermediate Accounting
BUS 311 Federal Income Taxation
BUS 312 Financial Statement Reporting and Analysis
BUS 313 Intermediate Accounting II
BUS 330 Principles of Finance
BUS 334 Advertising and Promotion
BUS 335 Consumer Behavior
BUS 336 Business Marketing
BUS 331 Business Strategy
BUS 333 Financial Management
BUS 370 Lean Practices in Operations
BUS 371 Supply Chain Management
BUS 372 Quality Management
BUS 488 Business Internship
BUS 489, 490 Business Honors Research I, II

Acceptance to the Major in Business Management

Requirements for the Major in Business Management (BUS)
The major in Business Management leads to the Bachelor of Science degree.
Completion of the major requires approximately 67 credits (including 21 credits for the minor requirement).

A. Core Courses
BUS 110 Business in the 21st Century
BUS 210 Financial Accounting
BUS 215 Introduction to Business Statistics (see Note)
BUS 220 Introduction to Decision Sciences (formerly Management Science) (see Note)
BUS 330 Principles of Finance or ECO 389 Corporate Finance

BUS 346 Operations Management
BUS 348 Principles of Marketing
BUS 441 Business Strategy or BUS 353 Entrepreneurship
ECO 108 Introduction to Economics (see Note)

Note: MAT 122 – Overview of Calculus with Applications satisfies DEC C and must be completed as a prerequisite for ECO 108, BUS 215 and BUS 220.

B. Business Electives
Two from the following:
BUS 301 Corporate Communications
BUS 340 Information Systems in Management
BUS 347 Business Ethics
BUS 351 Human Resource Management
BUS 352 Electronic Commerce
BUS 354 Understanding Business Agreements
BUS 390 Special Topics in Management
BUS 440 International Management
POL 319 Business Law

C. Area of Specialization
One of the following specializations must be chosen at the start of the junior year. The details are available in the College of Business Office of Student Services.

Choose one specialization from the following areas:
1. Accounting
   a. Required courses:
      BUS 214 Managerial Accounting
      BUS 310 Intermediate Accounting I
      BUS 311 Federal Income Taxation
   b. Select one from the following:
      BUS 312 Financial Statement Reporting and Analysis
   C. Business Honors Research
   D. Business Internship

2. Marketing
   a. Required courses:
      BUS 334 Advertising and Promotion
      BUS 337 Principles of Sales
      BUS 339 Consumer Behavior
      BUS 340 Business Marketing
      BUS 448 Business Internship

3. Finance
   a. Select four from the following:
      BUS 335 Investment Analysis
      BUS 356 Financial Engineering
      BUS 357 Financial Management
      ECO 360 Money and Banking
      ECO 383 Public Finance
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS

COURSE DESCRIPTIONS

http://www.stonybrook.edu/ugbulletin

Fall 2007: updates since Spring 2007 are in red
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS

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Fall 2007: updates since Spring 2007 are in red
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS
BUS 488 Business Internship

4. Operations
   a. Required course
      BUS 340 Information Systems in Management
   b. Select three from the following:
      BUS 370 Lean Practices in Operations
      BUS 371 Supply Chain Management
      BUS 372 Quality Management
      BUS 488 Business Internship

Note: BUS 475, 476 Undergraduate Independent Research will count toward the total University credit requirement, but not toward the business major.

D. Upper-Division Writing Requirement
   All undergraduate Business ... to a business organization.
   Business majors work with ... 
   ... College of Business Blackboard Web site http://blackboard.sunysb.edu/.

E. Minor Requirement
   A minor (typically 18-21 credits) in any area must be completed as part of the requirement for the business management major. Students that have a second major can be waived from the minor requirement.

Graduation Clearance
   Students must be cleared by their respective second major or minor before they can be cleared for the business major requirements

Grading
   All courses taken to satisfy the business management major requirements must be taken for a letter grade. All students accepted to the business management major in the fall 2005 semester and subsequent must complete all BUS courses, ECO 108, and MAT 122 with a grade of C or higher in order to satisfy the requirements for the major. Students accepted to the business management major prior to fall 2005 must complete the following courses with a grade of C or higher in order to satisfy the requirements for the major: BUS 110, 210, 220 (formerly BUS 249), 340, 346, 347, 348, 440, and 441; AMS 102, ECO 108, MAT 122 or 123, PSY 103 or SOC 106.

The Honors Program in Business Management
   The honors program in Business Management is oriented towards research. For admission to the program, students must be BUS majors with junior standing and have earned a cumulative g.p.a. of at least 3.30 through the spring semester of their sophomore year. Three BUS courses, BUS 110, 210, and 220, must have been completed with a cumulative g.p.a. of at least 3.30. Qualified students must submit an essay describing innovative ideas for business research and a letter of recommendation from a faculty member. They will be interviewed to assess motivation to pursue the honors program curriculum, which includes a research methods course taken in the junior year and a two-semester honors research project and paper completed in the senior year. Students must maintain a 3.00 cumulative g.p.a. to remain in the program, but conferral of honors is contingent upon completion of all required courses with a g.p.a. of 3.50 or higher, both overall and in business management courses.

Requirements for the Minor in Business Management (BUS)
   The Business Management minor is intended for students pursuing other majors who seek a foundation in business studies. The minor complements their chosen major by introducing them to principles and techniques used in business and management.

   The minor can be completed with 21-22 credits, assuming the appropriate prerequisite courses have been taken. All courses must be taken for a letter grade.
   1. BUS 110 Business in the 21st Century
   2. Two courses from the following:
      BUS 215 Intro. to Business Statistics
      BUS 220 Introduction to Decision Sciences (formerly Management Science)
      ECO 108 Introduction to Economics
   3. Three courses from the following:
      BUS 210 Financial Accounting
      BUS 340 Information Systems in Management
      BUS 346 Operations Management
      BUS 348 Principles of Marketing
      BUS 351 Human Resource Management
   4. BUS 441 Business Strategy

Chemical and Molecular Engineering (CME)

[Effective Fall 2006]

See added text in red below.

The Department of Materials Science and Engineering offers two majors leading to ...and the synthesis of new materials.

The program’s mission is to (a) serve the community by becoming a resource for regional economic development and (b) serve the nation by training students who can assume leadership in technological innovation, public service, and ethical standards. Its goal is to achieve international recognition as a center of excellence in molecularly based chemical engineering education and research.

Program Educational Objectives
   The undergraduate program in chemical and molecular engineering has the following five specific program educational objectives:

1. Provide students with in depth knowledge of the basic physical sciences, mathematical techniques and computational tools that form the foundation of modern chemical and molecular engineering.

2. Develop a program that immediately provides the students with a sense of work place relevance by effectively integrating classroom instruction with research, informal education, management, and industrial experience.

3. Build a broad based interdisciplinary educational curriculum in which students are taught to assimilate a complex set of knowledge and provide solutions to difficult problems involving both scientific, ethical, and moral considerations.

4. Educate students to operate effectively as part of a coordinated team which requires good communication skills (written and oral), leadership and mentoring skills, ability to provide original contributions which build upon and enhance the group effort, and a strong commitment to upholding ethical and moral standards of intellectual property.

5. Graduate students who are well prepared and committed to a lifetime of continuous learning in order to meet the constantly emerging needs of the
chemical and molecular engineering profession.

Program Outcomes
To prepare students to meet the above program educational objectives, a set of program outcomes that describes what students should know and be able to do when they graduate, have been adopted. We expect students to gain:

a. the ability to apply knowledge of mathematics, science, and engineering to chemical engineering problems;
b. the ability to design and conduct experiments, as well as to analyze and interpret data;
c. the ability to design a system, component, or process to meet desired needs;
d. the ability to function on multidisciplinary teams;
e. the ability to identify, formulate, and solve engineering problems;
f. the understanding of professional and ethical responsibility;
g. the ability to communicate effectively;
h. the broad education necessary to understand the impact of biomedical engineering solutions in a global and societal context;
i. the recognition of the need for, and an ability to engage in, life-long learning;
j. a knowledge of contemporary issues;
k. the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
l. a thorough grounding in chemistry and a working knowledge of advanced chemistry such as organic, inorganic, physical, analytical, materials, biochemistry, or environmental sciences, selected based on the student’s interest;
m. a working knowledge, including safety and environmental aspects, of material and energy balances applied to chemical processes; thermodynamics of physical and chemical equilibria; heat, mass, and momentum transfer; chemical reaction engineering; continuous and stage-wise separation operations; process dynamics and control.

C. Polymer Science
Provides a foundation in the properties of polymers, spectroscopy of organic compounds, polymer synthesis, and polymer processing for students interested in pursuing research in major laboratories or in academia.

ESM 369 Polymers
CHE 344 Spectroscopy of Organic Compounds
ESM 370 Polymer Synthesis
ESM 371 Polymer Processing

E. Environmental Sensing and Compliance
Provides a background in environmental studies enabling students to apply their knowledge of molecular chemistry to air pollution and control, environmental remediation, waste disposal, and compliance with OSHA safety standards in industry.

ATM 397 Air Pollution and its Control
MAR 308 Principles of Instrumental Analysis
MAR 334 Remote Sensing of the Environment
MAR 391 Environmental Policy

3. Computer Programming
one of the following:

CSE 130 Introduction to Programming in C
ESG 111 C Programming for Engineers
MEC 111 Computer Science for Engineers
MEC 112 Practical C/C++ for Scientists and Engineers
ESE 124 Computer Techniques for Electronic Design

Computer Engineering (ECE)

[Effective Fall 2006]

Two new sections enumerating Program Educational Objectives and Program Outcomes have been added:

The objective of the electrical and computer engineering programs … the requirements for that major.

Program Educational Objectives
The undergraduate program in the computer engineering program has the following five specific program educational objectives:

1. Our graduates should excel in engineering positions in industry and other organizations that emphasize design and implementation of engineering systems and devices.
2. Our graduates should excel in the best graduate schools, reaching advanced degrees in engineering and related disciplines.
3. Within several years from graduation our alumni should have established a successful career in an engineering-related multidisciplinary field, possibly leading or participating effectively in interdisciplinary engineering projects, as well as continuously adapting to changing technologies.
4. We expect our graduates to continue personal development through professional study and self-learning.
5. We expect our graduates to be good citizens and cultured human beings, as well as to appreciate the importance of professional, ethical, and societal responsibilities.

Program Outcomes
To prepare students to meet the above program educational objectives, a set of program outcomes that describes what students should know and be able to do when they graduate, have been adopted. We expect our graduates to attain:

a. an ability to apply knowledge of mathematics, science, and engineering;
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
d. an ability to function on multidisciplinary teams;
e. an ability to identify, formulate, and solve engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively;
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. a recognition of the need for ability to engage in life-long learning;
j. a knowledge of contemporary issues; and
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

More details about program educational objectives and outcomes can be found at http://www.ece.sunysb.edu/peos.
Following graduation many students choose...

Revisions to this section are listed in red below:

Requirements for the Major in Computer Engineering (ECE)

(...)

1. Mathematics

(...)

2. Natural Sciences

   PHY 131/133, 132/134 Classical Physics I, II and laboratories
   CHE 131/133 Chemistry for Engineers and laboratory

Note: The physics course sequence PHY 125, 126, 127 or 141, 142 is accepted in lieu of PHY 131/133, 132/134.
   (Students are advised to take PHY 127 before PHY 126.) CHE 141/143 are accepted in lieu of CHE 131/133.

The chemistry course sequence CHE 131, 132, and 133 or 141, 142, and 143 is accepted in lieu of CHE 138 and 139.

The following section has been added:

Requirements for the Combined BE Computer Engineering/MS Electrical Engineering Degrees

The intent of the combined five-year Bachelor of Engineering in Computer Engineering and Master of Science in Electrical Engineering program is to prepare high-achieving and highly-motivated undergraduate computer engineering students for either doctoral studies or a variety of advanced professional positions. Computer engineering students interested in the combined program should apply through the undergraduate office of the Department of Electrical and Computer Engineering. The program is highly selective and is offered to the top 10%-20% of the junior undergraduate class. Admission is based on academic performance (a major g.p.a. of at least 3.40) as well as undergraduate research and professional activities. The combined program is as rigorous as the current B.E. and M.S. programs taken separately. The requirements for the combined program are the same as the requirements for the B.E. and M.S. programs except that two 300-level electives in the B.E. program are substituted by two 500-level graduate courses. Therefore six graduate credits will be counted towards the undergraduate degree. Detailed guidelines and sample course sequences are provided by the Department.

Computer Science (CSE)

Two new sections enumerating Program Educational Objectives and Program Outcomes have been added:

The Department of Computer Science offers ... also offers a minor in computer science.

Program Educational Objectives

Within 5 years of graduation, alumni of the Computer Science undergraduate program should be:

1. Conducting successful careers in computer science-related disciplines and adapting to emerging markets and technologies.
2. Contributing to the development of local, national, and global economies.
3. Pursuing life-long learning opportunities, particularly graduate education.
4. Leading interdisciplinary design teams in government, academic, or industrial settings.

Program Outcomes

On completion of the program, graduates of the program should be able to:

s1. design, develop, test, and evaluate software systems;

s2. recognize the need for, and expect to engage in, life-long learning for continued professional excellence;

s3. apply their knowledge to the solution of practical and useful problems;

s4. communicate effectively; and

s5. work collaboratively.

In addition, undergraduates must:

s6. have a solid understanding of computational theory and foundational mathematics;

s7. have substantial exposure to advanced topics in software and computing systems;

s8. have a comprehensive general education background;

s9. be prepared to successfully enter the job market and/or graduate studies; and

s10. understand professional responsibility.

More details about program educational objectives and outcomes can be found at http://cs.sunysb.edu/admissions/Objectives.html.
9. Upper-Division Writing Requirement: CSE 300 Writing in Computer Science

All degree candidates must demonstrate technical writing skills at a level that would be acceptable in an industrial setting. To satisfy the requirement, students must pass CSE 300, a course that requires the completion of various writing assignments, including at least one significant technical paper.

Dance (DAN)

[Reinstated Fall 2005, amended Spring 2006]

The minor in dance provides an approach to the educational experience of dance that integrates movement, thought, sensation and feeling. Through the use of a global lens, students build upon traditions from numerous dance cultures and use them as a catalyst for performance, experimentation, research and learning.

Stony Brook University's Dance Program enables and encourages students to move toward their human potential through studies in movement and dance. Through active experiences in theory, technique, creative process, performance and craft, students are given opportunities to work, play, explore and delight in the action and discipline of embodied thinking and dance performance.

The curriculum offers courses which encourage students to embrace a lifelong journey through intellectual, creative and performance challenges. The dance minor examines the practice and study of movement and dance, with the detail of technique, form, content, structure, shape, energy, creativity, craft, design, rhythm, and dynamic quality. But the goal of the study is to enable students to become more fully human, with all of the intelligence, discipline, playfulness, and purpose necessary to inspire work in a number of disciplines and career paths.

Past dance minors have embarked on careers in performance, company management, research, business, teaching, and numerous other contributions to society.

Courses Offered in Dance

See the Course Descriptions listing in this Bulletin for complete information.

DAN 102-D Introduction to World Dance Cultures
DAN 164-D Tap Technique and History
DAN 165-D Contemporary Dance I
DAN 166-D Ballet Technique I
DAN 167-D Jazz Dance Technique I
DAN 168-D World Dance I
DAN 264-D Movement Awareness and Analysis
DAN 353 Special Topics in Dance Performance
DAN 365 Contemporary Dance II
DAN 366 Ballet Technique II
DAN 367 Jazz Dance Technique II
DAN 368 Dance Improvisation
DAN 369-J World Dance II
DAN 400 Performance Dance Ensemble
DAN 465 Contemporary Dance III
DAN 467 Jazz Dance Technique III
DAN 468 Choreography
DAN 475, 476 Undergraduate Teaching Practica I, II
DAN 487 Independent Research
DAN 488 Internship

Requirements for the Minor in Dance (DAN)

All courses offered for the minor must be passed with a letter grade of C or higher. At least 12 of the 24 credits must be taken at Stony Brook.

Completion of the minor requires 24 credits.
1. DAN 102 Introduction to World Dance Cultures
2. DAN 264 Movement Awareness and Analysis
3. One of the following:
   DAN 164 Tap Technique and History
   DAN 165 Contemporary Dance I
   DAN 166 Ballet Technique I
   DAN 167 Jazz Dance Technique I
   DAN 168 World Dance I
4. One of the following:
   DAN 365 Contemporary Dance II
   DAN 366 Ballet Technique II
   DAN 367 Jazz Dance Technique II
   DAN 369 World Dance II
5. One of the following:
   DAN 465 Contemporary Dance III
   DAN 467 Jazz Dance Technique III

6. DAN 368 Dance Improvisation
7. DAN 353 Special Topics in Dance Performance
8. DAN 400 Performance Dance Ensemble
Earth and Space Sciences (ESS)

[Effective Fall 2006]

Substantial changes have already been made to ESS since the publication of the Bulletin; text in green has been changed for Fall 2006.

Requirements for the Major in Earth and Space Sciences (ESS)

Requirements for the Earth and Space Sciences Track

Notes:

(...) 3. For the concentration in chemistry, the sequence CHE 123, 124, 132 or CHE 129, 132 may be used to satisfy requirement C3.

Requirements for the Earth Science Education Track

(...) 3. For the concentration in chemistry, the sequence CHE 123, 124 or CHE 129, 132 may be substituted for CHE 131, 132, with permission of the undergraduate program director.

Electrical Engineering (ESE)

[Effective Fall 2006]

Two new sections enumerating Program Educational Objectives and Program Outcomes have been added:

Program Educational Objectives

The undergraduate program in electrical engineering program has the following five specific program educational objectives:

1. Our graduates should excel in engineering positions in industry and other organizations that emphasize design and implementation of engineering systems and devices.
2. Our graduates should excel in the best graduate schools, reaching advanced degrees in engineering and related disciplines.
3. Within several years from graduation our alumni should have established a successful career in an engineering-related multidisciplinary field, possibly leading or participating effectively in interdisciplinary engineering projects, as well as continuously adapting to changing technologies.

4. We expect our graduates to continue personal development through professional study and self-learning.
5. We expect our graduates to be good citizens and cultured human beings, as well as to appreciate the importance of professional, ethical, and societal responsibilities.

Program Outcomes

To prepare students to meet the above program educational objectives, a set of program outcomes that describes what students should know and be able to do when they graduate, have been adopted. We expect our graduates to attain:

a. an ability to apply knowledge of mathematics, science, and engineering;

b. an ability to design and conduct experiments, as well as to analyze and interpret data;

c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;

d. an ability to function on multidisciplinary teams;

e. an ability to identify, formulate, and solve engineering problems;

f. an understanding of professional and ethical responsibility;

g. an ability to communicate effectively;

h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;

i. a recognition of the need for, and an ability to engage in, life-long learning;

j. a knowledge of contemporary issues; and

k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

More details about program educational objectives and outcomes can be found at http://www.ece.sunysb.edu/peos.

See revised text in red.

Requirements for the Major in Electrical Engineering (ESE)

(...) 1. Mathematics

(...) 2. Natural Sciences

PHY 131/133, 132/134 Classical Physics I, II and Laboratories

CHE 131/133 Chemistry for Engineers and Laboratory

Note: The physics course sequence PHY 125, 126, 127 or 141, 142 is accepted in lieu of PHY 131/133, 132/134. (Students are advised to take PHY 127 before PHY 126.) The chemistry course sequence CHE 141 and 143 is accepted in lieu of CHE 131 and 133. 3. Freshman Introduction to Electrical Engineering

(...) 4. Core Courses

ESE 211 Electronics Lab A

ESE 218 Digital Systems Design

ESE 224 Computer Techniques for Electronic Design II

ESE 231 Introduction to Semiconductor Devices

ESE 271 Electrical Circuit Analysis

ESE 305 Deterministic Signals and Systems

ESE 306 Random Signals and Systems

ESE 314 Electronics Laboratory B

Grading

All courses taken for the major must be taken for a letter grade. A grade of C or higher is required in the following courses:

1. ESE 211, ESE 218, ESE 231, ESE 271, ESE 300, ESE 337, ESE 372, AMS 151, AMS 161 (or MAT 131, MAT 132), PHY 131, PHY 132

2. For students in the Microelectronics Specialization: ESE 304, ESE 311, ESE 330, ESE 355, ESE 373

3. For students in the Telecommunications Specialization: ESE 340, ESE 342, ESE 346, ESE 347, ESE 363

4. For students in the General Track: Four ESE Technical Electives

This section has been added.
Supplement: Majors, Minors, and Programs

Requirements for the Combined BE/MS degrees in Electrical Engineering

The intent of the combined five-year Bachelor of Engineering and Master of Science in Electrical Engineering program is to prepare high-achieving and highly-motivated undergraduate electrical engineering students for either doctoral studies or a variety of advanced professional positions. Electrical engineering students interested in the combined program should apply through the undergraduate office of the Department of Electrical and Computer Engineering. The program is highly-selective and is offered to the top 10%-20% of the junior undergraduate class. Admission is based on academic performance (at least a major g.p.a. of 3.40) as well as undergraduate research and professional activities. The combined program is as rigorous as the current B.E. and M.S. programs taken separately. The requirements for the combined program are the same as the requirements for the B.E. and M.S. programs except that two 300-level electives in the B.E. program are substituted by two 500-level graduate courses. Therefore six graduate credits will be counted towards the undergraduate degree. Detailed guidelines and sample course sequences are provided by the Department.

Other upper-division courses (BIO 343, 353; MAR 301, 302, 304, 307, 308, 334, 350, 351, 366, 371, 390) may be substituted for MAR 315 and/or MAR 385 with permission of the director of undergraduate studies.

Notes:
1. CHE 141, 143 Honors Chemistry and Lab may be substituted for CHE 131, 133
2. PHY 121/123, 122/124 or 125, 126, 127 or 131/133, 132/134 or 141, 142 may be substituted for PHY/ENS 119.

Engineering Science (ESG)

Two new sections enumerating Program Educational Objectives and Program Outcomes have been added:

The program mission is ... evolving high-technology environment.

Program Educational Objectives

Alumni of the ESG program should be engaged in the following activities:
1. Conducting successful careers in engineering or science-related disciplines, by recognizing and responding to emerging markets and technologies or completing graduate studies in top ranked institutions.
2. Contributing to the development of globally competitive economies on a regional and/or national scale.
3. Leading interdisciplinary research, design, and/or policy-making teams in government, academic, or industrial settings.
4. Engaging in life-long learning activities, including professional society membership and support, conference attendance, presentations or organization, and knowledge-transfer or community-based outreach activities in their organizations.
5. Conducting themselves in the engineering professions in a manner which holds paramount the importance of public health, safety and welfare, as well as their own ethical responsibilities.

Program Outcomes

Engineering programs must demonstrate that their students attain:

a. an ability to apply knowledge of mathematics, science, and engineering;
French (FRN)
[Effective Fall 2006]
See revised text in red.
Requirements for the Major in French Language and Literature (FRN)
The major in French Language and Literature leads to ...
... highly encouraged to study more than one foreign language.
All courses offered for the major must be passed with a letter grade of C or higher.
Transfer students must take at least 18 credits of French in residence at Stony Brook. Please note that FRN 475/476 (Undergraduate Teaching Practicum) may not count for the major or minor.

German Language and Literature (GER)
[Effective Spring 2006]
Changes in three sections of the German entry are indicated below in red.
Requirements for the Major in German Language and Literature (GER)
Add/change information in red below:
1. HUG 229 Germany Today
2. GER 343 Introduction to Literary Genres
3. GER 344 Survey of German Literature
4. GER 311, 312 German Conversation and Composition I, II
5. GER 313 German Vocabulary in Conceptual Groups
6. GER 438 Structure of German
7. GER 439 History of German
8. 12 additional credits...
Requirements for the Minor in German (GER)
A. Emphasis on German Language and Literature
Add/change information in red below:
1. HUG 229 Germany Today
2. GER 343 Introduction to Literary Genres
3. GER 344 Survey of German Literature
4. GER 311, 312 German Conversation and Composition I, II
5. GER 313 German Vocabulary in Conceptual Groups
6. GER 438 Structure of German
7. One additional German course at the 400 level

Health Sciences
The Health Sciences Center (HSC) consists of four professional schools: the schools of Dental Medicine, Health Technology and Management, Nursing, and Social Welfare. The Stony Brook Medical Center consists of the School of Medicine and Stony Brook University Hospital. The Health Sciences Schools offer professional education to approximately 3,000 students annually and conduct programs in research, service, and continuing professional education.

School of Health Technology and Management
B.S. Athletic Training
B.S. Clinical Laboratory Sciences
B.S. Cytotechnology
B.S. Health Science
B.S. Respiratory Care
B.S. Health Science/M.S. Occupational Therapy multi-award degree
M.S. Health Care Policy and Management
Advanced Certificate in Health Care Management
M.S. Physician Assistant
(entry-level or post-professional)

Athletic Training Pre-Application Requirements
1. 3 credits of English composition: WRT 102

Clinical Lab Sciences Pre-Application Requirements
4. 12 credits of chemistry with labs (including inorganic and one course in organic chemistry or biochemistry)

Health Science
The School of Health Technology and Management offers a Bachelor of Science degree in Health Science with areas of concentration in Anesthesia Technology; Environmental Health; Health Care Informatics; Health Care Management; Medical Billing and Coding; Medical Dosimetry; Pharmacy Technician; Public Health/Community Health Education; Emergency and Disaster Management; Emergency Medical Service Specialist; Disability Studies; Nuclear Medicine; Radiologic Technology and Radiation Therapy.

Scholars for Medicine
Scholars for Medicine earn a B.A./M.D. degree with four years of undergraduate course work and four years of medical school. All Scholars for Medicine are individually counseled on their careers throughout their participation in the program. Benefits include full or partial scholarship funds, help in finding laboratory placements for undergraduate research, regular advising from either the Director of the Honors College or WISE Program and the premedical advisor, opportunities to meet faculty in the School of Medicine, and support and encouragement in the exploration of...
undergraduate and career opportunities.

Scholars for Medicine positions are available to select entering freshmen who have been accepted to either the Honors College or WISE Programs.

History (HIS)

[Effective Fall 2006]

See revised text in red.

Requirements for the Major in History (HIS)

Completion of the major requires 39 credits.

A. Study within the Area of the Major

A minimum of eleven courses (33 credits) distributed as follows:

1. Two courses at the 100 level
2. A primary field of five courses to be selected from one of the following: United States, European, Asian, Latin American, ancient and medieval, or global history. Primary fields developed along topical or thematic lines may be selected with approval of the Department’s undergraduate director. The primary field shall be distributed as follows:
   Two courses at the 200 level
   Two courses at the 300 level
   One course at the 400 level, excluding HIS 447, 487, 488, 495, and 496
3. HIS 301 is a required course for all history majors and must be taken prior to the 400-level seminar.
4. Three courses selected from outside the primary field and above the 100 level, with at least one of these courses at the 300 or 400 level.

B. Courses in a Related Discipline

(...)

C. Upper-Division Writing Requirement

Students are required to complete one upper-division course from Group A (study within the area of the major) by the end of their junior year. They must inform the instructor of the course in advance of their plan to use the term paper (or papers) in fulfillment of the writing requirement for the major. In addition to the grade for the course, the instructor makes a second evaluation of writing competency in the field of history. If the second evaluation is favorable, the paper will be submitted to the Undergraduate Director for final approval.

Italian Studies (ITL)

[Effective Spring 2006]

See revised text in blue.

The change to Italian Studies major requirement 2 is indicated below in red.

Requirements for the Major in Italian Studies (ITL)

A. Concentration in Language and Literature

1. Required courses:
   ITL 311 ...
2. Elective courses
   Six additional ITL courses at the 400-level. In consultation with the undergraduate academic adviser, up to three of these courses may be substituted with relevant HUI courses.
3. Upper-Division Writing Requirement: see C below.

[Effective Fall 2006]

See revised text in red.

Requirements for the Major in Italian Studies (ITL)

The major in Italian Studies leads to ...

... hotel management, or translation and interpretation.

All students should consult with ...

... the director of undergraduate studies.

All courses offered for the major must be passed with a letter grade of C or higher. Transfer students must take at least 18 credits of the major language in residence at Stony Brook.

Notes: (#2 deleted...Students whose language proficiency is such that they may be exempt from ITL 311, 312 may, and are strongly encouraged to, apply to have a course in art, music, history, or another language count for major credit.)

1. Credits for ITL 411 and 412 cannot be transferred and must be taken at Stony Brook.
2. Students who wish to offer their native language as the main area of concentration are asked to replace ITL 311 and 312 by English courses appropriate to their level of proficiency in that language.

3. Students in the Foreign Language Secondary Teacher Education Program must complete 36 ITL credits and should include FLA 439 when choosing electives.

4. ITL 475, 476 and HUI 475, 476 cannot be applied toward the requirements for the major in Italian.

Journalism (JRN)

[Effective Fall 2006]

The entire Journalism major and minor have been revised.

Courses Offered in Journalism

See the Course Descriptions listing in this Bulletin for complete information.

JRN 101-B News Literacy
JRN 102 Colloquium on the News
JRN 106-F The History and Future of the American Press
JRN 110 News I: Basic News Reporting and Writing
JRN 201 Journalism That Changed the World
JRN 210 News II: Beat Reporting
JRN 220 Media Law and Ethics
JRN 301 Journalism 24/7
JRN 310 News III: Reporting and Writing for Broadcast
JRN 320 The Promise and Perils of Online Journalism
JRN 331 Specialized Beat Reporting (Government)
JRN 332 Specialized Beat Reporting (Culture and Lifestyle)
JRN 333 Business Reporting
JRN 337 Introduction to Narrative Journalism
JRN 350 The Principles of Editing
JRN 388 Advanced Feature and Magazine Writing
JRN 389 Investigative Reporting
JRN 394 Journalism Practicum
JRN 395 News Editing
JRN 488 Internship

See the Course Descriptions listing in this Bulletin for complete information.

JRN 108-F The History and Future of the American Press
JRN 110 News I: Basic News Reporting and Writing
JRN 201 Journalism That Changed the World
JRN 210 News II: Beat Reporting
JRN 220 Media Law and Ethics
JRN 301 Journalism 24/7
JRN 310 News III: Reporting and Writing for Broadcast
JRN 320 The Promise and Perils of Online Journalism
JRN 331 Specialized Beat Reporting (Government)
JRN 332 Specialized Beat Reporting (Culture and Lifestyle)
JRN 333 Business Reporting
JRN 337 Introduction to Narrative Journalism
JRN 350 The Principles of Editing
JRN 388 Advanced Feature and Magazine Writing
JRN 389 Investigative Reporting
JRN 394 Journalism Practicum
JRN 395 News Editing
JRN 488 Internship
Requirements for the Minor in Journalism

The journalism minor emphasizes knowledge and exposure to basic skills for students who seek an understanding of broadcast, online, and print media. Courses in the minor provide students with a broad introduction to journalistic principles and practices as well as an understanding of the role of journalism in society. This program will be useful to students who are interested in sharpening their information-gathering and analytical skills, improving the speed and clarity of their writing, and improving their ability to communicate in whatever career they pursue.

18 credits are required for the Minor in Journalism. Courses must be passed with a C or higher to count toward the minor. Students are required to complete at least nine credits of upper division journalism courses to complete the Minor in Journalism.

Not all courses are offered each semester, so programs should be planned as early as possible. Prerequisites will be enforced.

Grammar Immersion

To progress in the minor program, students must pass a grammar proficiency test as part of JRN 110. The course includes a six-week immersion lab in grammar, punctuation, and sentence structure. Students who pass a proficiency test will be exempt from the lab. All other students must take the lab and pass the test.

A. Courses required of all minors (9 credits):
   - JRN 101-B News Literacy
   - JRN 110 Newswriting I
   - JRN 301 Journal 24/7

B. Students must take one course from this list (3 credits):
   - JRN 108 The History and Future of the American Press
   - JRN 201 Journalism That Changed the World

C. Electives (6 credits)
   Electives include courses not taken in B, above.
   - JRN 210: News II: Beat Reporting
   - JRN 220: Media Law and Ethics
   - JRN 310: Newswriting III: Reporting and Writing for Broadcast
   - JRN 320: The Promise and Perils of Online Journalism
   - JRN 337: Intro to Narrative Journalism

Note: Minors may take additional journalism electives with permission of instructor.

Korean Studies (KOR)

[Effective Fall 2006]

The Korean Studies minor has been significantly revised.

Requirements for the Minor in Korean Studies (KOR)

Completion of the minor requires 18 credits. Only one course offered for the minor may be taken under the Pass/No Credit option. All other courses for the minor must be taken for a letter grade. At least nine credits toward the minor must be from upper division courses.

1. One introductory course for Korean Studies as below:
   - AAS 217-J Introduction to Korean Culture

2. Two courses among the courses below:
   - KOR 111 Elementary Korean I
   - KOR 112 Elementary Korean II
   - KOR 211 Intermediate Korean I
   - KOR 212 Intermediate Korean II
   - KOR 311 Advanced Korean I
   - AAS 240-J Confucianism and Taoism
   - AAS 246-J Korean and Japanese Religions
   - AAS 260-J Buddhism

3. Three electives among the courses below:
   - AAS 321-G Korean Literature
   - AAS 367-J Meditation and Enlightenment
   - AAS 300-G Intellectual History of East Asia
   - KOR 331-F Social Sciences Topics in Korean Studies
   - KOR 332-G Humanities Topics in Korean Studies
   - KOR 351 Studies in Korean Literature
   - AAS 346 Philosophy of Education in Korea and Japan
   - AAS 400 Seminar in Korean Studies

Note: Appropriate special topics from other departments may also be offered to fulfill minor requirements with permission of the program director.

Linguistics (LIN)

[Effective Spring 2007]

Five-Year Combined BA/MA Program with Teacher Certification in Teaching English to Speakers of Other Languages (TESOL)

In addition to the regular BA program in Linguistics with teacher certification and the regular MA in TESOL, the Linguistics department offers a five-year combine BA/MA degree program. Upon completion of the five-year program, graduates will hold a Bachelor’s degree in Linguistics, New York State teaching certification in TESOL, and a Master’s degree in TESOL. The combined program will allow students the opportunity to complete these requirements one semester sooner than students who complete the programs sequentially. The combined program is restricted to students with an outstanding undergraduate record who are expected to excel in the graduate program.

During the first four semesters as an undergraduate, students in the combined program will pursue a normal course of study for the BA in Linguistics with New York State certification in TESOL. Students must apply to the five-year combined program in the second semester of the sophomore year. During the third year of study students will take two pedagogy courses and the field components associated with them at the graduate level, and will student-teach in the second semester of the fourth year. They will then enter the graduate program prepared to complete the MA degree in one year of full-time study.

The following are the minimum requirements for admission to the combined program:

1. A minimum GPA of 3.0 overall and 3.3 in linguistics courses;
2. The PEP admissions essay;
3. Recommendations from two linguistics faculty members;
4. Interviews with the Undergraduate Director in Linguistics and the Director of the TESOL program.

www.stonybrook.edu/ugbulletin
2. Students majoring in Linguistics may be interested in the following courses offered through other departments:

- EGL 300, 380
- FLA 339, 439, 440
- FRN 411
- GER 438, 439
- HBW 415
- HUL 324
- ITL 424, 425, 426
- PHI 325
- RUS 439
- PSY 365
- SPN 393, 462, 463, 465

Manufacturing Engineering (MFE)

[Effective Fall 2006]

Title changes are in red.

Requirements for the Minor in Manufacturing Engineering (MFE)

Requirements for students majoring in Engineering Science (ESG)

1. ESM 334 Materials Engineering and ESM 335 Strength of Materials
or MEC 310 Introduction to Machines Design and MEC 410 Design of Machine Elements

Requirements for all other students

1. ESM 334 Materials Engineering and ESM 335 Strength of Materials
or MEC 310 Introduction to Machines Design and MEC 410 Design of Machine Elements

3. One course chosen from the following:

- ESE 123 Introduction to Electrical and Computer Engineering
- ESG 100 Introduction to Engineering Science
- MEC 101 and 102 Engineering Computing and Problem Solving I, II

5. ESM 335 Strength of Materials

ESM 369 Polymers

Marine Sciences (MAR)

[Effective Fall 2006 See revised text in red.]

Requirements for the Major in Marine Sciences (MAR)

The major in Marine Sciences leads to a Bachelor of Sciences degree. Completion of the major requires between 68 and 73 credits. ...

2. Oceanography Core (13 credits)

- MAR 349 Biological Oceanography
- MAR 352 Introduction to Physical Oceanography
- MAR 353 Physical Oceanography Laboratory
- MAR 351 Introduction to Ocean Chemistry
- MAR 305 Experimental Marine Biology

3. Marine Biology (15-17 credits)

- BIO 353 Marine Ecology
- Four marine biology electives from below:
  - BIO 343 Invertebrate Zoology
  - BIO 346 Aquatic Arthropods and Vertebrates
  - MAR 301 Environmental Microbiology
  - MAR 302 Marine Microbial Ecology
  - MAR 303 Long Island Marine Habitats
  - MAR 315 Conservation Biology
  - MAR 320 Limnology
  - MAR 366 Plankton Ecology
  - MAR 370 Marine Mammals
  - MAR 371 Marine Birds and Turtles
  - MAR 380 Ichthyology
  - MAR 385 Fisheries Biology
  - MAR 388 Tropical Marine Ecology
  - MAR 394 Environmental Toxicology and Public Health
  - MAR 487 Research or MAR 488 Internship (maximum of three credits can be used for required elective)

Marine Vertebrate Biology (MVB)

[Effective Fall 2006]

Requirements for the Major in Marine Vertebrate Biology (MVB)

The major in Marine Vertebrate Biology leads to a Bachelor of Sciences degree. Completion of the major requires between 68 and 73 credits. ...

1. Foundation Courses (42-45 credits)

- BIO 150 The Living World
- BIO 201 Organisms to Ecosystems
- BIO 202 Molecular and Cellular Biology
- BIO 203 Cellular and Organ Physiology
- CHE 131/133, 132/134 General Chemistry and Lab (see Note 1)
- CHE 321 Organic Chemistry
- MAT 125, 126 Calculus (See Note 2)
- ENS/PHY 119 Physics for Environmental Studies and MAR 352 Introduction to Physical Oceanography Laboratory or PHY 121/123, 122/124 Physics for Life Sciences and labs (see Note 3)
- AMS 102 or AMS 110 Statistics

Mathematics (MAT)

[Effective Fall 2006]

See changes in red to the Math Placement Exam entry.

Placement

The Department of Mathematics offers a placement examination which indicates the level of mathematical preparation of each student. The score on the examination is used to place the student in appropriate courses in mathematics, applied mathematics and statistics, biology, chemistry, and physics. It tests the student’s skills at the time the test is taken; students are advised to study beforehand. There is a preliminary version of the examination given prior to orientation; all incoming students, including transfers, should take the preliminary placement examination. This exam is used only for registration purposes and cannot be used to fulfill graduation requirements. The preliminary score becomes invalid after two semesters.

A student wishing to use the placement examination to fulfill D.E.C. Category C or other graduation-related requirements or Skill 1, or if they have been or wish to be accepted into a major in the College of Engineering and Applied Sciences, must pass the examination during the first semester.
Mechanical engineering is one of the core disciplines of engineering and it encompasses a large number of subdisciplines that are at the heart of both traditional and leading edge technologies. It is a broad profession frequently concerned with activities such as energy conversion, power generation, design, and manufacturing. The theoretical and technical bases of knowledge include the pure sciences, mathematics, and the engineering sciences, especially the mechanics of solids and fluids, thermodynamics, and kinematics. Mechanical engineering requires aptitude and interest in the physical sciences and the language of mathematics, and the ability to apply these to societal needs.

The educational objectives of the undergraduate mechanical engineering program at Stony Brook University recognize that students have a variety of career objectives and a choice of industrial environments in which to pursue them. While the majority of our graduates are immediately employed in industry, a significant percentage pursues graduate study. Most of the students entering graduate schools continue mechanical engineering studies. However, some go to law, business, and medical schools. The mechanical engineering curriculum provides students with a core education in mathematics and the physical sciences along with a broad sequence of courses covering thermal processes and fluid mechanics, mechanical design, solid mechanics, and the dynamic behavior and control of mechanical systems. Students also take courses that introduce them to the use of advanced computational methods for engineering design and analysis as well as data processing and analysis. A series of laboratory courses introduces them to sensors and electronics, modern instrumentation and experimental techniques used in engineering for tasks ranging from product design, evaluation, and testing to research. In addition, students can select electives to provide either a higher level academic training in preparation for graduate school or a broader exposure to subjects related to engineering practice to enhance their preparation for a job after graduation.

Program Educational Objectives

The educational objectives of the mechanical engineering program are to prepare our graduates to:

1. Establish a successful career in mechanical engineering or related fields in industry and other organizations where an engineering approach to problem solving is highly valued.

2. Contribute significantly in a multidisciplinary work environment with high ethical standards and with an understanding of the role of engineering in the economy and the environment.

3. Excel in graduate study and research, reaching advanced degrees in engineering and related disciplines.


Program Outcomes

To prepare students for the above educational objectives, we have adopted the following set of program outcomes that describes what they are expected to attain when they graduate:

a. the ability to apply knowledge of mathematics, science, and engineering to mechanical engineering problems (in particular, a knowledge of chemistry and calculus-based physics with depth in at least one, an ability to apply advanced mathematics through multivariate calculus and differential equations, and a familiarity with statistics and linear algebra);

b. the ability to design and conduct experiments and to analyze and interpret data;

c. the ability to work professionally in multidisciplinary teams;

d. the ability to identify, formulate, and solve engineering problems;

e. the ability to function as a member of multidisciplinary teams;

f. a solid understanding of professional and ethical responsibility;

g. an ability to communicate effectively in written, oral, and visual form;

h. the broad education necessary to understand the impact of engineering
solutions in a global and societal context;
i. a recognition of the need for and the ability to engage in life-long learning;
j. a knowledge of contemporary issues; and
k. the ability to use modern engineering techniques, skills, and computing tools necessary for engineering practice.

More details about the program educational objectives and outcomes can be found at http://me.eng.sunysb.edu/abet.php.

Add at end of entry:

The Combined B.E./M.S. Degree Program in Mechanical Engineering

The combined B.E./M.S. program in mechanical engineering allows students to use up to nine graduate credits taken as an undergraduate towards both B.E. and M.S. degree requirements, thus reducing the normal time required to complete both degrees. The program is designed for upper-division mechanical engineering students with superior academic records. For detailed program requirements, including admission requirements, please refer to the Graduate Bulletin.

Multidisciplinary Studies (MTD)

[Effective Spring 2007]

Upper-Division Writing Requirement

All students majoring in Multidisciplinary Studies must satisfy the upper-division writing requirement established in one of the two or three departments chosen for distribution of Multidisciplinary Studies major credit. The department in which the upper-division writing requirement is satisfied must be a department within the College of Arts and Sciences. Students must report the department in which they will meet the upper-division writing requirement to the director of the Multidisciplinary Studies major by the start of their final semester. Details of the writing requirement for each major are listed among the major requirements in each department. In cases where there is no clearly identified department, the student should consult with an advisor in the Multidisciplinary Studies major.

Religious Studies (RLS)

B. Depth requirement

Four courses at the 200, 300, and 400 levels in one of the following areas of emphasis:

1. Hinduism (SKT 111, 112 may also count as one course for this area)

Technological Systems Management (TSM)

[Effective Fall 2006]

See revised text in red.

Requirements for the Major in Technological Systems Management (TSM)

A. Mathematics

(...)

B. Natural Sciences

(...)

C. Study in Related Areas: Specialization

(...)

D. Technological Systems Management

1. Required courses (10)

   EST 192 Introduction to Modern Engineering
   EST 194 Patterns of Problem Solving
   EST 202 Introduction to Science, Technology, and Society Studies
   EST 305 Applications Software for Information Management
   EST 325 Technology in the Workplace
   EST 382 Technology Assessment
   EST 392 Engineering and Managerial Economics
   EST 393 Project Management
   EST 400 Interdisciplinary Research Methods
   EST 411 Interdisciplinary Senior Project

2. Electives

Four from the following list:

   EST 300 Computer Modeling and Experiments in Mathematics and Science Education
   EST 302 Assessment of Computer-Based Technologies
   EST 303 Crisis Communication
   EST 304 Communication for Engineers and Scientists

Parameters

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EST 320 Communication Technology Systems  
EST 330 Natural Disasters; Societal Impacts and Technological Solutions  
EST 331 Ethics and Intellectual Property  
EST 411 Science, Technology, and Arms Control  
EST 412 Intelligence Organizations, Technology, and Democracy  
EST 420 Seminar on Information-Age Society  
EST 421 Starting the High-Technology Venture

Theatre Arts (THR)  
[Effective Spring 2005]

All dance courses with the THR designator have become DAN courses. There have been no substantive changes to the Theatre Arts major, but there are many labelling revisions. See red below.

Courses Offered in Theatre Arts  
See the Course Descriptions listing in this Bulletin for complete information.

THR 100-D Performing and Performance  
THR 101-D Understanding Theatre  
THR 104-B Play Analysis  
THR 105-D Acting I  
THR 110 Public Speaking  
THR 115, 116 Stagecraft I, II  
THR 117 Media: Analysis and Culture  
THR 141 D Tap Technique and History  
THR 165-D Modern Dance Technique I  
THR 166-D Ballet Technique I  
THR 167-D Jazz Dance Technique I  
THR 200 Theatre Practicum I  
THR 205 Acting II  
THR 208 Technology in the Arts  
THR 216-D Introduction to Visual Interpretation  
THR 223-D Stage Costume  
THR 230 Voice for the Actor  
THR 232 Improvisation  
THR 246 Stage Lighting  

THR 264-D Movement Awareness and Analysis  
THR 277 The Media Industry  
THR 298 Student Media Leadership  
THR 300 Theatre Practicum II  
THR 301 Stage Management Laboratory  
THR 302 Theatre Management Laboratory  
THR 303 Costume Crafts Laboratory  
THR 304 Marketing Laboratory  
THR 305 Lighting and Sound Laboratory  
THR 306 Stagecraft Laboratory  
THR 307 Performance Laboratory  
THR 312-K American Theatre and Drama  
THR 313-J Asian Theatre and Drama  
THR 314-I European History and Drama: The Classical Era  
THR 316-I European History and Drama: The Modern Era  
THR 317 Interactive Performance, Media, and MIDI  
THR 318 Music and the Moving Image  
THR 320, 321 Production I, II  
THR 322 Acting III  
THR 323 Costume Design  
THR 325 Scriptwriting for Film and Television  
THR 326 Playwriting  
THR 333 Directing I  
THR 334-G Performance Art  
THR 336 Stage Management  
THR 337 Advanced Technical Theatre  
THR 346 Lighting Design  
THR 351, 352 Special Topics in Performance  
THR 353 Special Topics in Dance Performance  
THR 354 Topics in Dramaturgy  
THR 356 Scene Design  
THR 357 Modern Dance Technique II  
THR 358 Ballet Technique II  
THR 359 Jazz Dance Technique II  
THR 360 Dance Improvisation  
THR 361-J World Dance Forms  
THR 372 Introduction to Television  
THR 375 Television Production  
THR 378 Introduction to Radio Broadcasting  

THR 379 Radio News  
THR 380, 382 Company I, II  
THR 400 Performance Dance Ensemble  
THR 401 Senior Seminar  
THR 402 Senior Projects  
THR 403 Media: Theory and Criticism  
THR 406 Eastern Styles in Acting  
THR 439 Directing II  
THR 447 Readings In Theatre Arts  
THR 465 Modern Dance Technique and Performance  
THR 467 Jazz Dance Technique and Performance  
THR 483 Choreography  

THR 475, 476 Undergraduate Teaching Practica I, II  
THR 480 Projects in Media  
THR 483 Projects in Theatrical Design  
THR 484 Projects in Theater  
THR 487 Independent Research  
THR 488 Internship

Courses Offered in Dance  
See the Course Descriptions listing in this Bulletin for complete information.

DAN 102-D Introduction to World Dance Cultures  
DAN 164-D Tap Technique and History  
DAN 165-D Contemporary Dance I  
DAN 166-D Ballet Technique I  
DAN 167-D Jazz Dance Technique I  
DAN 168-D World Dance I  
DAN 264-D Movement Awareness and Analysis  
DAN 333 Special Topics in Dance Performance  
DAN 365 Contemporary Dance II  
DAN 366 Ballet Technique II  
DAN 367 Jazz Dance Technique II  
DAN 368 Dance Improvisation  
DAN 369-J World Dance II  
DAN 375 Dance Improvisation  
DAN 400 Performance Dance Ensemble  
DAN 465 Contemporary Dance III  
DAN 467 Jazz Dance Technique III  
DAN 468 Choreography  
DAN 475, 476 Undergraduate Teaching Practica I, II  
DAN 487 Independent Research  
DAN 488 Internship

Requirements for the Major in
Theatre Arts (THR)

A. Theatre Arts Core Program

1. Two of the following courses:
   
   THR 105 Acting I
   
   THR 117 Media: Analysis and Culture
   
   DAN 164 Tap Technique and History
   
   or DAN 165 Contemporary Dance I
   
   or DAN 166 Ballet Technique I
   
   or DAN 167 Jazz Dance Technique I