2007-2009 Undergraduate Bulletin Supplement

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.

Spring 2008
Fall 2007
Spring 2008 Updates

Applied Math and Statistics (AMS)

The Sequential B.S./M.S. Program in Applied Mathematics and Statistics

The sequential B.S./M.S. program in applied mathematics and statistics allows students with superior academic records to use up to nine graduate credits toward 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.

The advantage of the combined program is that the M.S. degree can be earned in less time than required by the traditional course of study. The M.S. degree in Applied Mathematics and Statistics normally requires three to four semesters of study after completion of a bachelor’s degree. The in-depth training of a master’s degree is required by many employers for professional positions in applied mathematics and statistics (beyond beginning programmer analyst jobs).

For more details about the B.S./M.S. program, see the undergraduate program director or graduate studies director in the Department of Applied Mathematics and Statistics.

The Combined B.S./M.P.H. Program in Applied Mathematics and Statistics

The combined B.S./M.P.H. program allows students with superior academic records to use up to twelve graduate credits toward both the B.S. in Applied Mathematics and Statistics and the M.A. in Public Health 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 or contact the undergraduate program director in Department of Applied Mathematics and Statistics or graduate studies director in the Department of Public Health.

Chemical and Molecular Engineering (CME)

Requirements for the Major in Chemical and Molecular Engineering (CME)

The curriculum begins with a focus on mathematics, physics, and chemistry, followed by courses covering specific chemical engineering topics as well as an intensive laboratory sequence. In addition, each student chooses a four-course sequence as an area of specialization which may also qualify the students for a minor in the respective department. The program culminates in the submission and acceptance of a senior thesis or original research project completed by the student which is defended at the end of the senior year. The students are encouraged to select original research projects which can be published in peer reviewed journals.

Requirements for the CME major

2. Natural Sciences
   a. Chemistry
      CHE 131, 132 General Chemistry I, II or CHE 141, 142
      CHE 133, 134 General Chemistry Laboratory I, II or CHE 143, 144
      CHE 321 Organic Chemistry I and CHE 326 Organic Chemistry II
      CHE 383, 384 Introductory and Intermediate Synthetic and Spectroscopic Laboratory Techniques
   b. Physics
      PHY 131, 132 Classical Physics I, II
      PHY 133, 134 Classical Physics Laboratory I, II
      PHY 251 Modern Physics and PHY 252 Modern Physics Laboratory or ESG 281 Engineering Instrumentation Laboratory
      Note: The following alternate physics course sequences may be substituted for PHY 131/133, 132/134:
      PHY 125, 126, 127 or PHY 141, 142

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

4. Engineering
   ESG 232 Materials Science I: Structure and Property of Materials

Grading

All courses taken to satisfy requirements 1-6 above [see full list of major requirements in the Bulletin] must be taken for a letter grade of C or higher, except in CME 304 which must be taken for a letter grade of B- or higher.

Specializations

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 384 Intermediate Synthetic and Spectroscopic Laboratory Techniques
CME 370 Cellular Biology for Chemical Engineers
CME 371 Biomedical Polymers
CME 470 Polymer Synthesis

F. Chemistry

The Chemistry specialization consists of 12 credits of upper level CHE 300 courses not already required for the CME Major

G. Physics

The Physics specialization consists of the following courses:
   PHY 301 Electromagnetic Theory
   PHY 303 Mechanics
   PHY 333 Electronics and Instrumentation Laboratory
   Three additional credits of upper level PHY 300 courses not required for the CME major.

Sample Course Sequence for the Major in Chemical and Molecular Engineering

<table>
<thead>
<tr>
<th>Sophomore Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMS 261</td>
<td>4</td>
</tr>
<tr>
<td>CHE 321</td>
<td>4</td>
</tr>
<tr>
<td>CHE 383</td>
<td>2</td>
</tr>
</tbody>
</table>
Spring 2008: updates since Spring 2007 are in red

### China Studies (CNS)

#### Requirements for the Minor in China Studies (CNS)

At least 12 credits must be taken in courses numbered 300 or higher. No more than 3 credits may be taken under the Pass/No Credit option; all other courses must be completed with a letter grade of C or higher.

Completion of the minor requires 18 credits.

1. One of the following:
   - AAS 220 China: Language and Culture
   - AAS/HIS 219 Introduction to Chinese History and Civilization

2. Elective courses:
   - Twelve credits chosen from the list of elective courses below and/or from the list of courses in China Studies (AAS) and courses in Chinese Language (CHI) listed above. At least nine credits must be in courses numbered 300 or higher.

3. Three credits AAS 487 Independent Research or three credits of AAS 404 Senior Seminar in China Studies.

### Thematic Tracks

Students are recommended (but not required) to follow any one of the thematic tracks within China Studies as outlined below.

#### Language and Linguistics Track

- AAS 220 China: Language and Culture
- CHI 111, 112, 210, 211, 212, 311, 312, 321, 322
- AAS 250: Languages and Cultures of Asian Americans
- AAS 350: Structure of Mandarin Chinese
- AAS 370: Intercultural Communication

#### Culture and Civilization Track

- HIS 219: Intro Chinese History & Civilization (foundation course)
- AAS/RLS 256 Hinduism
- AAS/RLS 260 Buddhism
- AAS/RLS 280 Islam
- AAS/RLS 300 Intellectual History of East Asia
- AAS 318 Arts of China
- HIS 345 Women and Gender in Chinese History
- AAS 371 Ancient China
- AAS 372 Family Marriage and Kinship in China

#### Science and Contemporary China Track

- AAS 221 China: Science and Civilization (foundation course)
- AAS 339 Contemporary China: history politics and diplomacy (post 1949)
- HIS 341 20th Century China
- AAS 352 Environmental History of China
- AAS 379 Ethnicity and Ecology in China

### Sample CNS Student Progress Profiles

#### Language and Linguistics Track

- Year 1 Fall: AAS 220 China: Language and Culture
- Year 1 Spring: AAS/HIS 219 Introduction to Chinese History and Civilization
- Year 2 Fall: CHI 311/321
- Year 2 Spring: AAS 404 Senior Seminar in China Studies

#### Culture and Civilization Track

- Year 1 Fall: HIS 219 Intro Chinese History & Civilization
- Year 1 Spring: AAS 372 Family Marriage and Kinship in China
- Year 2 Fall: AAS 318 Arts of China
- Year 2 Spring: AAS 404 China Studies Seminar
AAS 379 Ethnicity and Ecology
AAS 339 Contemporary China

Year 1 Spring:
AAS 221 China: Science and Civilization
HIS 341 20th Century China

Year 2 Spring:
AAS 352 Environmental History of China
AAS 404 China Studies Seminar

Spring 2008: updates since Spring 2007 are in red

Computer Science (CSE)

Specialization in Human-Computer Interaction
The specialization in human-computer interaction emphasizes both the psychology aspects of effective human-computer interactions and the technical design and implementation of systems for those interactions. It requires four core course, two electives, and a project. Students may declare their participation in the specialization after completing the courses in 1a and 1b. All courses must be completed with a grade of C or higher.

1. Core Courses
   a. CSE 323 Human-Computer Interaction
   b. PSY 260 Survey of Cognition and Perception
   c. CSE 328 Fundamentals of Computer Graphics or CSE 332 Introduction to Scientific Visualization
   d. CSE 333 User Interface Development or PSY 384 Research Lab: Human Factors

2. Two electives from the following, including at least one CSE course:
   a. CSE 327 Fundamentals of Computer Vision
   b. CSE 328 Fundamentals of Computer Graphics
   c. CSE 332 Introduction to Scientific Visualization
   d. CSE 333 User Interface Development
   e. CSE 334 Introduction to Multimedia Systems
   f. CSE 336 Internet Programming
   g. CSE 352 Artificial Intelligence
   h. CSE 364 Advanced Multimedia Techniques
   i. CSE 366 Introduction to Virtual Reality
   j. CSE 378 Introduction to Robotics
   k. CSE 390-394 Special Topics in Computer Science
   l. PSY 366 Human Problem Solving
   m. PSY 368 Sensation and Perception
   n. PSY 369 Special Topics in Cognition and Perception
   o. PSY 384 Research Lab: Human Factors

3. Project
   Completion of CSE 487 Research in Computer Science or CSE 488 Internship in Computer Science or CSE 495/496 Senior Honors Research Project I, II, on a topic in human-computer interaction.

Specialization in Game Programming
The specialization in game programming prepares students for a career as either a professional game developer or researcher. Game graphics and multiplayer network programming techniques are stressed. The specialization also emphasizes original game development, game design methodology, and team projects and presentations. It requires four core courses, two electives, and a project. Students may declare their participation in the specialization after completing the courses in 1a and 1b. All courses must be completed with a grade of C or higher.

1. Core Courses
   a. CSE 310 Data Communication and Networks or CSE 346 Computer Communications
   b. CSE 328 Fundamentals of Computer Graphics
   c. CSE 380 Computer Game Programming
   d. CSE 381 Advanced Game Programming

2. Two electives from the following:
   a. CSE 306 Operating Systems
   b. CSE 320 Computer Architecture
   c. CSE 334 Introduction to Multimedia Systems
   d. CSE 352 Artificial Intelligence
   e. CSE 364 Advanced Multimedia Techniques
   f. CSE 370 Wireless and Mobile Networking
   g. CSE 408 Network Security

3. Project
   Completion of CSE 487 Research in Computer Science or CSE 488 Internship in Computer Science or CSE 495/496 Senior Honors Research Project I, II, on a topic in game programming.

Sample Course Sequence for the Major in Computer Science

<table>
<thead>
<tr>
<th>Freshman Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Seminar 101</td>
<td>1</td>
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<tr>
<td>D.E.C. A</td>
<td>3</td>
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<tr>
<td>CSE 110</td>
<td>3</td>
</tr>
<tr>
<td>AMS 151</td>
<td>3</td>
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</tbody>
</table>
Natural science course 4
Total 14

Spring Credits
First Year Seminar 102 1
D.E.C. 3
CSE 114 4
AMS 161 3
Natural science course 4
Total 15

Sophomore Fall Credits
CSE 214 3
CSE 215 3
AMS 210 3
Natural science course 4
D.E.C. 3
Total 16

Spring Credits
CSE 219 3
CSE 220 3
AMS 301 3
D.E.C. 3
D.E.C. 3
Total 15

Junior Fall Credits
CSE 300 1
CSE Software course 3
CSE 303 3
AMS 310 3
D.E.C. 3
Elective 3
Total 16

Spring Credits
CSE 302 1
CSE Software course 3
CSE 373 3
CSE Elective 3
D.E.C. 3
Elective 3
Total 16

Senior Fall Credits
CSE 308 3
CSE Hardware Course 3
D.E.C. 3
D.E.C. 3
Elective 3
Total 15

Spring Credits
CSE Software course 3
CSE Elective 3
D.E.C. 3
Elective 3

Dance (DAN)
The minor in Dance has been reinstated.

Engineering Science (ESG)

Requirements for the Major in Engineering Science (ESG)

3. Computer Science: ESG 111
   Note: MEC 111 or MEC 112 or CSE 114 or CSE 130 or ESE 124 may be substituted with permission of the department.

Grading
All courses taken to satisfy Requirements A and B above must be taken for a letter grade. A grade of C or higher is required in the following courses (or their equivalents):

1. AMS 151, 161; PHY 131/133 and 132/134; ESG 217, 302, 312, 332, 339
2. Each of the five required technical electives offered by the college.

Areas of Specialization

Biomedical Engineering
2. Three courses from the following:
   BIO 202 Fundamentals of Biology: Molecular and Cellular Biology
   BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
   BIO 328 Mammalian Physiology
   BME 301 Bioelectricity
   BME 303 Engineering Methods in Biomechanics
   BME 304 Genetic Engineering
   BME 305 Biofluids
   ESM 353 Biomaterials: Manufacture, Properties, and Applications
   ESM 488 or 499 (See Note)
   ESG 440/441 Engineering Science Design III/IV (See Note)
   Note: Three credits of research (ESM 499 or 488) may be used as a technical elective with permission of the undergraduate program director.

Environmental Engineering Track:
1. Two required courses:
   ESM 212 Intro to Environmental Materials Engineering (or CME 318 Chemical Engineering Fluid Mechanics or MEC 364 Introduction to Fluid Mechanics or BME 305 Biofluids)
and CHE 312 Physical Chemistry
Short Course (or CHE 301 Physical Chemistry 1).
CHE 312 Physical Chemistry
2. Three technical electives chosen from:
   - CME 318 Chemical Engineering Fluid Mechanics or MEC 364
   - Introduction to Fluid Mechanics or BME 305 Biofluids may be taken as a technical elective if not taken as a required course
ESG 320 Sensor Materials and Devices
AMS 322 Groundwater Modeling
GEO 316 Geochemistry of Surficial Processes
GEO/MAR 318 Engineering Geology and Coastal Processes
MAR 301 Environmental Microbiology
MAR 336 Marine Pollution
MAR 394 Environmental Toxicology and Public Health
ATM 397 Air Pollution and its Control
CHE 361 Nuclear Chemistry
CHE 362 Nuclear Chemistry Laboratory
ESM 488 Cooperative Industrial Practice (3 credits)
or ESM 499 Research in Materials Science (3-4 credits)
or other departmental independent research with permission of the program director
ESG 440, 441 Engineering Science Design III, IV (See Note)
Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of the instructor and the undergraduate program director.

Electrical Engineering
3. Two courses chosen from the following:
   - ESE 305 Deterministic Signals and Systems
   - ESE 315 Control System Design

Mechanical and Manufacturing Engineering
1. One of the following two-course design sequences:

a. MEC 310 Introduction to Machine Design and MEC 410 Design of Machine Elements
b. MEC 335 Heat and Mass Transfer and MEC 364 Introduction to Fluid Elements
   - ESM 334 Materials Engineering and ESM 335 Strength of Materials

Engineering Research
   this specialization has been deleted

Engineering Management
Students may take a specialization in Engineering Management consisting of the following courses:
1. 1. Two required courses, ESG 392 Engineering and Managerial Economics and ESG 201 Engineering Responses to Society
2. Three technical electives which may be satisfied by the following courses:
   a. BUS 210 Financial Accounting
   b. BUS 330 Principles of Finance
   c. BUS 340 Information Systems in Management
   d. BUS 348 Principles of Marketing
   e. EST 305 Applications Software for Information Management
   f. EST 326 Management for Engineers
   g. EST 327 Marketing for Engineers
   h. EST 391 Technology Assessment
   i. EST 393 Project Management
   j. Another upper level course in Business, Technology and Society and Economics with the permission of the Undergraduate Program Director.

Bachelor of Engineering Degree/Master of Science Degree Program
An engineering science, engineering chemistry, or physics student may apply at the end of the junior year for admission to this special program, which leads to a Bachelor of Engineering or Bachelor of Science degree at the end of the fourth year and a Master of Science degree at the end of the fifth year. In the senior year, a student in the program takes ESM 511 Thermodynamics of Solids, ESM 512 Structure of Materials, and ESM 513 Strength of Materials three credits of ESM 599 Research. In addition, the Senior Design project (ESG 440/441) is planned in consultation with the graduate and undergraduate program directors, as well as the thesis advisor (if the student will be taking a thesis option M.S.) to ensure that it meets the needs of the M.S. program. In the fifth year the student takes 24 graduate credits, of which at least 15 credits are coursework and three credits are ESM 599. The advantages of this program over the regular M.S. program are that a student may start his or her M.S. thesis in the senior year, and that he or she needs only 24 credits in the fifth year as opposed to 30 credits for a regular M.S. student. For details of the M.S. degree requirements, see the Graduate Bulletin.

Sample Course Sequence for the Major in Engineering Science

<table>
<thead>
<tr>
<th>Sophomore Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AMS 261</td>
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</tr>
<tr>
<td>ESE 271</td>
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<td>MEC 260</td>
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<tr>
<td>ESG 217#</td>
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<tr>
<td>ESG 302</td>
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<th>Spring Credits</th>
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<tr>
<td>AMS 361</td>
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<tr>
<td>ESG 281</td>
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<tr>
<td>ESG 316</td>
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<tr>
<td>MEC 262</td>
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<tr>
<th>Junior Fall Credits</th>
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<tbody>
<tr>
<td>ESG 312# and 300</td>
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<td>D.E.C.</td>
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<tr>
<td>Total</td>
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<table>
<thead>
<tr>
<th>Senior Fall Credits</th>
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<tbody>
<tr>
<td>ESG 440#</td>
</tr>
<tr>
<td>ESM 450</td>
</tr>
<tr>
<td>Technical elective#</td>
</tr>
<tr>
<td>Technical elective (design)#</td>
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<tr>
<td>D.E.C.</td>
</tr>
<tr>
<td>ESG 375</td>
</tr>
<tr>
<td>Total</td>
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Information Systems (ISE)

Requirements for the Major in Information Systems (ISE)

The major in Information Systems leads to the Bachelor of Science degree. At least two of the courses under requirement A.2. below must be completed at Stony Brook.

Completion of the major requires approximately 70 credits.

A. Information Systems/Computer Science Courses

1. CSE 114 Computer Science I
   CSE 213 Foundations of Computer Science II
   CSE 214 Computer Science II
   CSE 215 Foundations of Computer Science
   CSE 219 Computer Science III
   CSE 220 Computer Organization and Systems Programming
   CSE 110 Introduction to Computer Science

2. ISE/CSE 305 Principles of Database Systems
   ISE/CSE 308 Software Engineering
   ISE/CSE 310 Data Communication

3. Six additional upper-division CSE or ISE courses at a level of 200 or higher, including at least four upper division courses, excluding CSE and ISE 475.

B. Economics and Business Courses

1. BUS 111 Introduction to Business for Non-Business Majors
2. ECO 106 Introduction to Economics
3. BUS 210 Financial Accounting

4. One course chosen from the following:
   BUS 347 Business Ethics
   BUS 348 Principles of Marketing
   ECO 326 Industrial Organization
   ECO 343 Transformation in Economic Systems
   ECO 345 Law and Economic Issues
   POL 319 Business Law
   POL 359 Public Policy Analysis
   POL 364 Organizational Decision Making
   SOC 381 Sociology of Organizations

5. One course chosen from the following:
   BUS 340 Information Systems in Management
   BUS 343 Expert Systems in Business
   EST 302 Assessment of Computer-Based Technologies
   EST 305 Applications Software in Information Management
   EST 320 Communication Technology Systems
   EST 325 Technology in the Workplace

Specialization in Psychology

Students may take a specialization in Psychology consisting of the following courses:

1. Core Courses
   a. PSY 103 Introduction to Psychology
   b. PSY 201 Statistical Methods in Psychology
   c. PSY 310 Research and Writing in Psychology

2. One of the following:
   PSY 220 Survey in Developmental Psychology
   PSY 230 Survey in Clinical Psychology
   PSY 240 Survey in Social Psychology
   PSY 250 Survey in Biopsychology
   PSY 260 Survey in Cognition and Perception

3. Two additional courses numbered 200 or higher, other than PSY 273, 283, 310, 399, 447, 475, 476, 487, 488, 495, 496

Specialization in Other Application Areas

A student may design a specialization in another application area of information systems in consultation with the ISE Undergraduate Director before the courses for the specialization are completed.

Sample Course Sequence for the Major in Information Systems

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Fall</th>
<th>Credits</th>
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<td>First Year Seminar 101</td>
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<td>AMS 151</td>
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<td>BUS 111</td>
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<table>
<thead>
<tr>
<th>Sophomore</th>
<th>Fall</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CSE 213</td>
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<td></td>
</tr>
<tr>
<td>CSE 214</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CSE 215</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>AMS 201</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECO 106 (D.E.C.F)</td>
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<tr>
<td>D.E.C.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>
Mechanical Engineering (MEC)

Grading
All courses taken to satisfy requirements 1 through 8 above must be taken for a letter grade. The grade point average for the courses MEC 260, 262, 301, 305, 310, 316, 317, 320, 326, 363, 364, 410, 411, 422, 440, 441, and all technical electives (with the exception of MEC 488) must be at least 2.00. A minimum grade of “C” in MEC 260 and MEC 262 is required for the BE degree. When a course is repeated, the higher grade will be used in calculating this average.
Fall 2007 Updates

Astronomy/Planetary Sciences (AST)

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
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 126 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) | 4
BIO 287 | 2
D.E.C. | 3
Total | 15

Sophomore Spring | Credits
---|---
BIO 203 | 3
CHE 328 | 4
CHE 327 | 2
BIO 285 | 2
D.E.C. | 3
Total | 14

Requirements for the Major in Biochemistry

B. Core Courses in Biology
2. BIO 201 Fundamentals of Biology: Organisms to Ecosystems
3. BIO 202 Fundamentals of Biology: Molecular and Cellular Biology
4. BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
4. BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I

4. BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II
   Note: Beginning in 2007 BIO 201, 202, and 203 will be only lecture courses. Two new laboratory classes, BIO 204 and BIO 205, will be required of all biochemistry majors.

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
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
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; 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 201 Fundamentals of Biology: Organisms to Ecosystems
   BIO 202 Fundamentals of Biology: Cell and Molecular Biology
   BIO 203 Fundamentals of Biology: Cellular and Organ Physiology

B. BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I and
   BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II

C. Nine credits at the 300 level

D. A lecture course in at least two of the five areas of inquiry (I-V) listed under the biology major.
Biomedical Engineering (BME)

Sophomore Fall Credits
AMS 261 4
ME 200 3
BIO 202 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

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESE 300#</td>
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<tr>
<td>ESE 382#</td>
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</tr>
<tr>
<td>ESE 306</td>
<td>4</td>
</tr>
<tr>
<td>ESE xxx#</td>
<td>3</td>
</tr>
<tr>
<td>CSE 219</td>
<td>3</td>
</tr>
<tr>
<td></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.
College of Business between their junior and senior years, must take five elective courses in their senior year chosen from amongst the 500-level courses (MBA 5XX) offered by the Business School in the MBA curriculum. As per the requirements of the MBA program, the student will in their fifth year fulfill the remaining requirements for an MBA degree, as well complete a summer abroad and summer internship program.

This specialization requires acceptance of the student into early admission into the MBA fast track program in the Fall of their junior year. Course selection for the specialization must be made with the advice and approval of the student’s advisor in the College of Business. Please see the web site for the MBA program for further details.

Environmental Engineering (ENE)

Environmental engineering is the application of science and engineering principles to improving the environment (air, water, and/or land resources), to providing healthful water, air and land for human habitation and for other organisms, 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 sustainability and green manufacturing. The coursework of the Minor emphasizes the chemical mechanisms at work behind environmental processes which govern production and transport of pollutants, bioavailability and toxicity, and changing ecological and geochemical factors, 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
   - 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.

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)

C. Concentration (12 credits)

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 2 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.

Sample Course Sequence for the Major in Linguistics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIN 301@#</td>
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</tr>
<tr>
<td>LIN 201*#</td>
<td>3</td>
</tr>
<tr>
<td>LIN 345@#</td>
<td>3</td>
</tr>
<tr>
<td>Foreign language 211*</td>
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<td>D.E.C.</td>
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Spring Credits

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<tr>
<td>LIN 301*#</td>
<td>3</td>
</tr>
<tr>
<td>Foreign language 212*</td>
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<tr>
<td>D.E.C.</td>
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Junior Fall Credits

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</thead>
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<td>LIN 355@#</td>
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</tr>
<tr>
<td>LIN 340@#</td>
<td>3</td>
</tr>
<tr>
<td>LIN 211*#</td>
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</tr>
<tr>
<td>D.E.C.</td>
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</tr>
<tr>
<td>SSE 327@#</td>
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Junior Spring Credits

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<td>LIN 431*#</td>
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<td>LIN 375@#</td>
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<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

* Course must be taken for the major.
@ Course fulfills the major requirement but is not obligatory.
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

First Year Seminar 102 1
D.E.C. A 3
CHE 132 4
CHE 134 1
MAT 126 3
Total 12

Sophomore Fall

BIO 201 and 204 5
AMS 110 3
CHE 321 4
D.E.C. 3
D.E.C. 3
Total 18

Sophomore Spring

BIO 203 and 205 5
MAR elective 3
D.E.C. 3
D.E.C. 3
D.E.C. 3
Total 17

Junior Fall

BIO 202 3
MAR 349 4
ENS/PHY 119 4
Upper-Division D.E.C. 3
Total 14

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

First Year Seminar 102 1
D.E.C. A 3
CHE 132 4
CHE 134 1
MAT 126 3
Total 12

Sophomore Fall

BIO 201 and BIO 204 5
AMS 110 3
CHE 321 4
CHE 134 1
MAT 126 3
Total 12

Sophomore Spring

BIO 202 and BIO 205 5
AMS 110 3
CHE 321 4
D.E.C. 3
D.E.C. 3
Total 18

Sophomore Fall

BIO 201 and BIO 204 5
AMS 110 3
CHE 321 4
D.E.C. 3
D.E.C. 3
Total 18

Sophomore Spring

BIO 202 and BIO 205 5
BIO 344 4
## Mechanical Engineering (MEC)

### Sophomore Spring

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

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<td>MEC 301</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>
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### Junior Spring

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>MEC 300</td>
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<td>MEC 305</td>
<td>3</td>
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<tr>
<td>MEC 310</td>
<td>3</td>
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<tr>
<td>MEC 317</td>
<td>2</td>
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<td>MEC 320</td>
<td>3</td>
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<td>MEC 125</td>
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<tr>
<td>MEC 325</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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</tbody>
</table>

### 4. Mechanical Engineering

- MEC 101 Engineering Computing and Problem Solving I
- MEC 102 Engineering Computing and Problem Solving II
- MEC 125 Fundamentals of Machining
- MEC 202 Engineering Drawing and CAD I
- MEC 203 Engineering Drawing and CAD II
- MEC 214 Probability and Statistics
- MEC 260 Engineering Statics
- MEC 262 Engineering Dynamics
- MEC 301 Thermodynamics
- MEC 325 Manufacturing Processes
- MEC 305 Heat and Mass Transfer
- MEC 363 Mechanics of Solids
- MEC 364 Introduction to Fluid Mechanics

## Pharmacology (BCP)

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

1. B. Courses in Biological Sciences
   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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHE 321</td>
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</tr>
<tr>
<td>BIO 202 and BIO 204</td>
<td>5</td>
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<tr>
<td>D.E.C.</td>
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<td>D.E.C.</td>
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### Sophomore Spring

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<tr>
<td>BIO 203 and BIO 205</td>
<td>5</td>
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<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><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 if C or better to satisfy the requirements for the specialization:

A. Required Departmental Courses (12 credits)
   PHY 301 Electricity and Magnetism I
   PHY 302 Electricity and Magnetism II
   PHY 308 Quantum Mechanics I
   PHY 452 Lasers

B. Optics-related laboratory experience
   PHY 487 Research (at least 3 credits—optics related)

C. One additional elective course:
   Either PHY 405 Quantum Mechanics II, or
   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)
- ESM-325 (Diffraction Techniques).

Psychology (PSY)

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

<table>
<thead>
<tr>
<th>Freshman/Spring</th>
<th>Credits</th>
</tr>
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<tr>
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<tr>
<td>D.E.C. A</td>
<td>3</td>
</tr>
<tr>
<td>PSY Group A (220 or 230 or 240) OR PSY Group B (250 or 260)</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
</tr>
<tr>
<td>MAT 126 or 132 or 142</td>
<td>3-4</td>
</tr>
<tr>
<td>D.E.C.</td>
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Sophomore—Fall

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<tr>
<td>PSY Group B (if Group A taken) OR Group A (if Group B taken)</td>
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<td>BIO 201, 202, or 203, and 204</td>
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<td>D.E.C.</td>
</tr>
<tr>
<td>D.E.C.</td>
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Sophomore—Spring

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<tbody>
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<td>PSY 310</td>
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<td>PSY Group A or B</td>
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<td>PSY elective***</td>
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<td>BIO 201, 202, or 203, and 205</td>
</tr>
<tr>
<td>D.E.C.</td>
</tr>
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<td>Total</td>
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</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.

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.

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).

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>EST 192 Introduction to Modern Engineering</td>
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<tr>
<td>EST 194 Patterns of Problem Solving</td>
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<tr>
<td>EST 202 Introduction to Science, Technology, and Society Studies</td>
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<tr>
<td>EST 305 Applications Software for Information Management</td>
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<td>EST 326 Management for Engineers</td>
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<td>EST 327 Marketing for Engineers</td>
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<tr>
<td>EST 391 Technology Assessment</td>
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<td>EST 392 Engineering and Managerial Economics</td>
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<td>EST 393 Project Management</td>
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<tr>
<td>EST 440 Interdisciplinary Research Methods</td>
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<td>EST 441 Interdisciplinary Senior Project</td>
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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 390 Natural Disasters; Societal Impacts and Technological Solutions
   EST 391 Ethics and Intellectual Property
   EST 421 Starting the High-Technology Venture

D. Technological Systems Management

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