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 2009
Fall 2008
Spring 2008
Spring 2009 Updates

Anthropology (ANT)

Requirements for the Major in Anthropology (ANT)

A. Study within the Area of the Major
1. Two introductory courses chosen from:
   - ANT 102 Introduction to Cultural Anthropology
   - ANT 104 Introduction to Archaeology
   - ANP 120 Introduction to Physical Anthropology
2. One course in social and cultural anthropology at the 200 level or higher
3. One course in archaeology at the 200 level or higher
4. One course in physical anthropology at the 200 level or higher
5. Six additional anthropology courses (two courses from another department may be substituted with the approval of the director of undergraduate studies)
6. One 400-level seminar chosen from ANT 401, 402, 405, 415, 417, 418, 419, 420, ANP 403 or 404

B. Upper-Division Writing Requirement
Anthropology majors must achieve an evaluation of S (Satisfactory) for a paper written for a 300-level ANT or ANP course. The paper must be at least ten double-spaced pages.

Subfields of Study

Social and Cultural Anthropology

Archaeology

Physical Anthropology

Requirements for the Minor in Anthropology (ANT)

Social and Cultural Anthropology
1. ANT 102 Introduction to Cultural Anthropology
2. Three ethnographic area courses in social and cultural anthropology chosen from:
   - ANT 200 Island Southeast Asia
   - ANT 201 Peoples of South America
   - ANT 203 Native Peoples of North America
   - ANT 230 Peoples of the World
   - ANT 310 Ethnography
   - ANT 311 Immersion in Another Culture
   - ANT 366 Prehistoric and Historic Hunter-Gatherers
   - ANT 380 Race and Ethnicity in Latin America and the Caribbean
3. One topical course in social and cultural anthropology to be selected from ANT 350, 351, 352, 354, 361, 367, 380, 381, and also 390, 391 and 401 when the topic is applicable
4. Two elective courses in social and cultural anthropology

Art History and Criticism (ARH)

Requirements for the Major in Art History and Criticism (ARH)
The major in Art History and Criticism leads to the Bachelor of Arts degree. All courses offered for the major must be passed with a letter grade of C or higher.
Completion of the major requires 39 credits, at least 18 of which must be upper division.
1. Two introductory art history courses:
   - ARH 101 Art in Culture from Prehistoric Times to the Age of the Cathedrals, ca. 1400 A.D.
   - ARH 102 Art in Culture from the Early Renaissance, ca. 1400, to Postmodernism
2. One or two 400-level seminar courses
3. Courses in Art History and Criticism (21-24 credits) distributed to include at least one course in four of the following areas:
   a. Ancient and medieval art and architecture: ARH 300, 301, 302, 305, 325
   b. Renaissance (14th to 16th century) and Early Modern (17th to 18th century): ARH 306, 307, 310, 314, 315, 316, 320, 337, 390
   c. Modern (19th to 20th century) art and architecture: ARH 295, 322, 324, 330, 331, 332, 333, 341, 342
   d. Asian, Middle Eastern, African, Oceanic, Native American, and Mesoamerican art and architecture:
   e. Contemporary Art and Photography, Performance, and Visual Culture: CCS 101, ARH 334, 335, 44, 345, 365, 404
   f. Advanced Independent study: ARH 487, 495
4. One of the following (6 credits):
   - ARS 154 and one additional ARS course
   - Foreign language (especially for students planning graduate work in art history), a year of French or German or another language, after consultation with the Undergraduate Director

Biochemistry and Biology (BCH, BIO)

Major in Biochemistry (BCH)
All courses offered for the major must be taken for a letter grade. A minimum grade of C must be obtained in all courses in requirements A, B, and C below.
Completion of the major requires approximately 70 to 74 credits.

A. Courses in Related Fields
1. CHE 131, 132 General Chemistry or CHE 141, 142 Honors Chemistry
2. CHE 133, 134 General Chemistry Laboratory or CHE 143, 144 Honors Chemistry Laboratory
3. CHE 321, 326 Organic Chemistry I, IIB (See Note)
4. CHE 327 Organic Chemistry Laboratory A or CHE 383 Introductory Synthetic and Spectroscopic Laboratory Techniques
5. CHE 301 or 312 Physical Chemistry
6. MAT 125, 126, 127 Calculus A, B, C or MAT 131, 132 Calculus I, II or MAT 141, 142 or MAT 171 or level 9 on mathematics placement examination.
7. PHY 121/123, 122/124 Physics for the Life Sciences and Labs or PHY 125, 126, 127 Classical Physics A, B, C or PHY 141, 142 Classical Physics I, II: Honors
Note: The Chemistry Department offers two Organic Chemistry II Courses, CHE 322 (IIA) and CHE 326 (IIB). Biochemistry majors must
take CHE 326 Organic Chemistry II.

B. Core Courses in Biology
1. BIO 201 Fundamentals of Biology: Organisms to Ecosystems
2. BIO 202 Fundamentals of Biology: Molecular and Cellular Biology
3. BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
4. BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I
5. BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II

Note: Beginning in fall 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. Students having completed one or fewer of BIO 201, 202, 203 prior to Fall 2007 must complete BIO 204 and BIO 205; Students having completed two or more of BIO 201, 202, 203 prior to Fall 2007 are exempt from completing BIO 204 or BIO 205.

Requirements for the Major in Biology (BIO)
Students must complete a minimum of 33 credits in Requirements A and C. (See Note 1). All courses used to satisfy requirements A and C must be passed with a letter grade of C or higher. At least one semester of each of the following two-semester sequences must be passed with a letter grade of C or higher: calculus, general chemistry lecture, organic chemistry lecture, and physics lecture. Courses taken under the Pass/No Credit option may not be used to satisfy major requirements.

Completion of the major requires approximately 67 to 69 credits.

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

B. Courses Required in Related Fields
1. MAT 125, 126 Calculus A, B or MAT 131, 132 Calculus I, II or MAT 141, 142 Calculus I, II: Honors or MAT 171 Accelerated Single Variable Calculus or level 8 or 9 on the Mathematics Placement Examination.
2. CHE 129/130 or 131, 132 General Chemistry and CHE 133, 134 General Chemistry Laboratory or CHE 141, 142 Honors Chemistry and CHE 143, 144 Honors General Chemistry Laboratory
3. CHE 321, 322 or 326 Organic Chemistry I, II or IIB or CHE 331, 332 Honors Organic Chemistry
4. CHE 327 Organic Chemistry Laboratory or CHE 383 Introductory Synthetic and Spectroscopic Laboratory Techniques
5. PHY 121/123, 122/124 Physics for Life Sciences I, II and labs or PHY 125, 126, 127 Classical Physics A, B, C or PHY 131/133, 132/134 Classical Physics I, II and labs or PHY 141, 142 Classical Physics I, II: Honors
6. AMS 110 Probability and Statistics in Life Sciences or AMS 310 Survey of Probability and Statistics

C. Advanced Courses
All advanced Biology courses have one or more 200 level courses as a prerequisite. A grade of C or higher is required in each 200 level prerequisite in order to enroll in any 300 level Biology course. 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:
Area I: Cell Biology and Biochemistry
   BIO 310, 314, 315, 316, 317*, 361, 362
Area II: Genetics and Development
   BIO 320, 325, 339*
Area III: Neurobiology and Physiology
   BIO 317*, 328, 334, 338, 339*

Area IV: Organisms
   BIO 340, 341, 343, 344, 348, 380, MAR 370, 371
Area V: Ecology and Evolution
   BIO 301, 350, 351, 353, 354, 358, 359, 385, 386, MAR 301, 302, 366, ANP 325.02, 350.02, 391.02
   * BIO 317 and 339 may each be used to satisfy only one area.

Advanced Laboratory Courses:
Area IBIO 311, 365
Area II BIO 327
Area III BIO 335
Area IV BIO 340, 341, 343, 344, 380, MAR 380
Area V BIO 319, 352, 356, 367, 371, MAR 301, 303, 305, 320, 388
Area VI BIO 312

1. General Biology Specialization
   a. Advanced Lecture Courses: At least one lecture course in four of the five areas above. Students in the Biology Secondary Teacher Education Program must take a course in each of the five areas.
   b. Advanced Laboratory Courses: Two advanced laboratory courses chosen from any two of the six areas above.
   c. Study in Depth: A second lecture course in one of the five areas of inquiry or any 400-level BIO course for majors or SCI 454 (for students enrolled in the Biology Secondary Teacher Education Program). NOTE: BIO 318 can be used as a second course for any lecture area.
   d. Biology Electives: Additional advanced biology lecture, laboratory, and independent research and reading courses, as needed, for a minimum of 33 credits in Requirements A and C. (See Note 3)
2. Biomedical Engineering Specialization
Unlike other specializations, this one requires MAT 127 Calculus C, but not AMS 110.

a. Lecture/Laboratory Courses
   Requirement:
   BME 100 Introduction to Biomedical Engineering
   ESG 111 Programming for Engineers
   or MEC 112 Practical C/C++ for Scientists and Engineers
   or ESE 124 Computer Techniques for Electronic Design I
   or CSE 130 Introduction to Programming in C

b. Subspecializations:
   Students in this specialization must choose one of the three sub specializations described below.
   i. Biomechanics Subspecialization
      MEC 260 Engineering Statics
      BME 303 Engineering Methods in Biomechanics
      AMS 261 Applied Calculus III (or equivalent)
      One of the following two courses:
      BME 304 Genetic Engineering
      BME 381 Nanofabrication in Biomedical Applications
   ii. Bioelectricity Subspecialization
      ESE 271 Electrical Circuit Analysis I
      BME 301 Bioelectricity
      AMS 210 Applied Linear Algebra
      BME 313 Bioinstrumentation
   iii. Molecules and Cells Subspecialization
      BME 304 Genetic Engineering
      BME 381 Nanofabrication in Biomedical Applications
      ESG 332 Materials Science I: Structures and Properties of Materials
      One of the following three courses:
      BME 353 Biomaterials: Manufacture, Properties and Applications
      BME 404 Essentials of Tissue Engineering
      BME 430 Engineering Approaches to Drug and Gene Delivery

b. Breadth Requirement:
   i. One advanced biology lecture or one advanced lecture/laboratory course chosen from any area.
   ii. One advanced biology laboratory course chosen from any area. Note: Students who complete this specialization will automatically receive a biomedical engineering minor.

3. Developmental Genetics Specialization
a. Lecture/Laboratory Courses
   Requirement:
   i. BIO 320 General Genetics
   ii. BIO 325 Animal Development
   iii. BIO 327 Developmental Genetics Laboratory
   iv. BIO 310 Cell Biology or BIO 339 Molecular Development of the Nervous System

b. Breadth Requirement
   i. Two advanced biology lecture courses from outside the Developmental Genetics specialization.
   ii. One advanced biology laboratory (or lecture with laboratory) from outside the Developmental Genetics specialization.

c. Biology Electives
   Additional advanced biology lecture, laboratory, independent research and reading courses, as needed, for a minimum of 33 credits in Requirements A and C. (See Note 3)

4. Ecology and Evolution Specialization
a. BIO 351 Ecology
b. BIO 354 Evolution
c. Area Lecture/Laboratory Requirement: Students must choose one course from
   i. Lecture/Laboratory Courses
   or one course each from ii. Lecture Courses and iii. Laboratory Courses below.
   i. Lecture/Laboratory Courses
      BIO 340 Zoology
      BIO 341 Plant Diversity
   ii. Lecture Courses
      BIO 343 Invertebrate Zoology
      BIO 344 Chordate Zoology
      BIO 346 Aquatic Arthropods and Vertebrates
      BIO 380 Entomology
      MAR 301 Environmental Microbiology
   iii. Laboratory Courses
      MAR 302 Marine Microbiology and Microbial Ecology
      MAR 306 Plankton Ecology
      MAR 370 Marine Mammals
      MAR 371 The Biology and Conservation of Marine Birds and Sea Turtles
      ANP 325.02 Primate Behavior (Madagascar)
      ANP 350.02 Methods of Studying Primates (Madagascar)
      ANP 391.02 Topics in Physical Anthropology (Madagascar)

   d. Breadth Requirement
i. Two advanced biology lecture or lecture/laboratory courses chosen from any area excluding Area V, Ecology and Evolution above.

ii. One advanced biology laboratory (or lecture with laboratory) course chosen from any area excluding Area V, Ecology and Evolution above.

e. Biology Electives

Additional advanced biology lecture, laboratory, and independent research and reading courses, as needed, for a minimum of 33 credits in Requirements A and C.

5. Environmental Biology Specialization

a. BIO 351 Ecology

b. Area Lecture/Laboratory

Requirement: Two courses chosen from the lists below. In choosing courses, students must include at least one course with laboratory. Students may take no more than one course from i. Organisms, and no more than one course from iii. The Environment.

i. Organisms

BIO 340 Zoology (with lab)
BIO 341 Plant Diversity (with lab)
BIO 343 Invertebrate Zoology (with lab)
BIO 344 Chordate Zoology (with lab)
BIO 348 Diversity and Evolution of Reptiles
BIO 380 Entomology (with lab)
MAR 366 Plankton Ecology
MAR 370 Marine Mammals
MAR 371 The Biology and Conservation of Marine Birds and Sea Turtles
MAR 380 Ichthyology (lab)

ii. Ecology

BIO 301 Sustainability of the Long Island Pine Barrens
BIO 319 Landscape Ecology Laboratory
BIO 350 Darwinian Medicine
BIO 352 Ecology Lab
BIO 353 Marine Ecology
BIO 354 Evolution

(See Note 3) BIO 356 Applied Ecology and Conservation Biology Laboratory
BIO 358 Biology and Human Social and Sexual Behavior
BIO 359 Behavioral Ecology
BIO 367 Molecular Diversity Laboratory
BIO 385 Plant Ecology
BIO 386 Ecosystem Ecology in a Changing World
MAR 301 Environmental Microbiology (with lab)
MAR 302 Marine Microbiology and Microbial Ecology
MAR 303 Long Island Marine Habitats (with lab)
MAR 305 Experimental Marine Biology (lab)
MAR 320 Limnology (lab)
MAR 388 Tropical Marine Ecology (lab)
MAR 325.02 Primate Behavior (Madagascar)
MAR 350.02 Methods of Studying Primates (Madagascar)
MAR 391.02 Topics in Physical Anthropology (Madagascar)

iii. The Environment

ATM 305 Global Atmospheric Change
ATM 397 Air Pollution and its Control
MAR 318 Engineering Geology and Coastal Processes
MAR 333 Coastal Oceanography

b. Breadth Requirement

i. Two advanced biology lecture courses chosen from any area excluding Area III, Neurobiology and Physiology.

ii. One advanced biology laboratory (or lecture with laboratory) course chosen from any area excluding Area III, Neurobiology and Physiology.

c. Biology Electives

Additional advanced biology lecture, laboratory, and independent research and reading courses, as needed, for a minimum of 33 credits in Requirements A and C. (See Note 3)

D. Upper-Division Writing Requirement

The advanced writing component of the major in Biology requires approval by the writing committee of either:

a. A term paper written for an upper-division course in biological sciences at Stony Brook (including readings and research), or

b. two laboratory reports from a single upper-division course in biological sciences at Stony Brook.

A list of currently participating courses is available in the Undergraduate Biology Office. Students who wish to use material from a participating course should obtain the necessary

http://www.stonybrook.edu/ugbulletin
form and present it to the course director prior to submission of the material. The course director will provide a special evaluation of the writing (in addition to a grade), and send the completed form to the Biology Writing Committee (through the Undergraduate Biology Office). Materials from other biology courses may be used if they include a suitable writing component. They must be submitted to the writing committee, together with the form signed by the instructor.

Students are urged to submit appropriate materials in their junior year, or by the end of their next-to-last term, in order to allow for evaluation and possible remedial effort. Later submissions are considered, but may delay graduation. If material is rejected, the student is urged to attend the Writing Center (or to take an appropriate course) before resubmitting the paper or material from another biology course.

Notes:
1. Students with a high school Biology course and a math placement score of 3 or better can 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. Although not a required course, BIO 150 is recommended for majors with a math placement score of less than 3 and/or without prior biology training. The three credits of BIO 150 will count towards the Biology major, but not the minor.
2. 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)
Only students with majors other than Biology, Biochemistry, Pharmacology, Marine Sciences or Marine Vertebrate Biology may elect the Biology minor. All courses for the minor must be taken for a letter grade. (See Note 1) All credits for the minor, except for those in Requirement A, must be in BIO major courses taken at Stony Brook. Requests for waivers of minor requirements must be approved by the Undergraduate Biology Studies Committee.

Completion of the minor requires at least 20 credits in those biology courses designed for the Biology major, including:
A. At least 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. Both of the following courses:
   BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I and
   BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II
C. At least 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)

Additional Requirements for Pre-Medical or Pre-Dental Students
Seven additional credits are required for the pre-professional students beyond the B.E. in BME degree. These are CHE 133, CHE 134, BIO 203, and BIO 205. It is recommended that CHE 133 is taken during the Freshman Spring, CHE 134 taken during Sophomore Spring, and BIO 203/205 taken during Junior Spring.

Grading
All courses taken to satisfy 1 through 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; ESE 271; all BME courses.

Specializations
To complete the specialization, students choose from the technical elective course list for one of the four specializations. Other courses may be used towards this requirement with the permission of the undergraduate program director. A total of thirty credits in technical electives are required. Fifteen credits or more must be engineering designations. Nine must be BME (not BME 499), however six additional credits may be BME 499.

Chemical and Molecular Engineering (CME)

Sample Course Sequence for the Major in Chemical and Molecular Engineering

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<td>AMS 151</td>
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<td>ESG 111</td>
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Child and Family Studies (CFS)

Requirements for the Minor in Child and Family Studies (CFS)

A. Required Courses
CFS 210 Introduction to Human Growth and Development in the Family Context (PSY 220 may be substituted)
CFS 322 The Infant and Young Child

*Choose one set of classes from the following:
CFS 381 (Corequisite CFS 283) Seminar in Development and Education of Preschool Children and
CFS 283 (Corequisite CFS 381) Practicum in Development and Education of Preschool Children or
CFS 382 (Corequisite CFS 284) Seminar in Infant and Toddler Development and
CFS 284 (Corequisite CFS 382) Practicum in Infant and Toddler Development

*The seminar not used to fulfill the CFS courses may be used to satisfy one of the CFS electives

B. Four additional courses chosen from the following:
At least three courses must be upper-division, and at least one of these must be a CFS course at the 400 level.
CFS 287 Supervised Research
CFS 308 Violence in the Family
CFS 320 The Special Child
CFS 321 Early Childhood Environments
PSY 327 Human Growth and Development in the Educational Context
CFS 339 Children's Play
CFS 340 Children in Hospitals and Healthcare Settings
CFS 345 Parental Roles in a Pluralistic Society
CFS 344 Development and Aging in Adulthood
SSE 350 Foundations of Education
CFS 405 Seminar in Children, Law, and Social Policy
CFS 417 Senior Seminar

Cinema and Cultural Studies (CCS)

The Minor in Cinema and Cultural Studies

The minor in Cinema and Cultural Studies is designed to provide a broad overview of film and culture and to complement most majors in the arts and sciences.

Requirements for the Minor in Cinema and Cultural Studies (CCS)

All courses for the minor must be passed with a letter grade of C or higher.
Completion of the minor requires 21 credits.

A. CCS 101 Introduction to Cinema and Cultural Studies or CCS 201 Writing about Culture
B. HUM 201 Film Genres or HUM 202 Film History
C. CCS 301 Theorizing Cinema and Culture
D. Two courses from the following:
ARH 322, ARH 329, ARH 331, ARH 333, ARH 335, ARH 342, ARS/MUS/THR 318, ARS/ MUS/THR 317, ARS/ MUS/THR 318, ARS 325, ARS 326, ARS 327, ARS 425, MUS 300, MUS 340, CCS 313, CCS 395, CLT 360, CLT 391, CLT 392, CLT 393, CLT 394

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E. Six credits from the following:
CCS 311, CCS 312, CCS 390, CCS 391, CCS 392, CCS 393, CCS 394, CCS 401, CCS 487, CCS 488, CLT 335, HUS 390, SPN 420

Comparative Literature (CLT)

Requirements for the Minor in Comparative Literature (CLT)
The minor in Comparative Literature is designed especially to interest students majoring in a foreign language, English, and other humanities fields. It provides a broad overview of the theory and techniques of comparative study, and an opportunity for the student to bring comparative breadth to his or her major field of study.

Completion of the minor requires 21 credits.

A. Introduction
One course that surveys a literary theme historically and cross-culturally, selected from the following:
HUM 109 Philosophy and Literature in Social Context
HUM 121 Death and Afterlife in Literature
HUM 122 Images of Women in Literature
HUM 123 Sin and Sexuality in Literature

B. Background
Two courses beyond the introductory level, chosen from the following:
CLT 211, CLT 212, 220, 266 or one course per designator from the following: EGL 200-level, FRN 395, 396, ITL 395, 396, GER 344, HUR 341, JDH 261
or one of the following classical language courses: LAT 112 or SKT 112

C. Literature in the Original Language
At least one course in literature in its original language (other than English)

D. Theory
CLT 301 Theory of Literature
or CCS 301 Theorizing Cinema and Culture

E. Advanced Study
Two upper-division courses, one from group 1, and one from group 2:
Group 1:
CLT 331 Literary Genres: Poetry
CLT 332 Literary Genres: Drama
CLT 333 Literary Genres: Novel
CLT 334 Other Literary Genres
CLT 391 African Comparative Literature
CLT 392 Multicultural Comparative Literature
CLT 393 European Comparative Literature
CLT 394 Asian Comparative Literature

Group 2:
CLT 335 Interdisciplinary Study of Film
CLT 361 Literature and Society
CLT 362 Literature and Ideas
CLT 363 Literature and the Arts
CCS 311 Gender and Genre in Film
CCS 312 Cinema and the Ancient World
CCS 313 Television Studies
CCS 390 Latin American Cinema
CCS 391 Contemporary African Cinema and Cultural Studies
CCS 392 American Cinema and Cultural Studies

Education and Teacher Certification

Mathematics Secondary Teacher Education Program
PROGRAM CO-DIRECTOR: Nadia Kennedy, Ph.D., Department of Mathematics
PROGRAM CO-DIRECTOR: Lisa Berger, Ph.D., Department of Mathematics

Students who wish to enroll in the program should apply to the undergraduate mathematics teacher preparation program during the second semester of their sophomore year, or the first semes-
ter of their junior year. Applicants should have taken at least two semesters of calculus, linear algebra, and MAT 200. Completion of a third semester of calculus is strongly recommended. Applicants must have grades of “C” or higher in each of these courses, with an average grade of at least “B”. In addition, applicants are required to have an overall grade point average of 2.75 or higher.

Requirements for Initial Certification
A. Completion of either the mathematics or the applied mathematics and statistics major.

B. Completion of, or exemption from, the following courses:
• MAT 200 Language, Logic, and Proof;
• MAT 312 Applied Algebra OR MAT 313 Abstract Algebra
• MAT 319 Foundations of Analysis OR MAT 320 Introduction to Analysis
• MAT 336 History of Mathematics
• MAT 360 Geometric Structures
• AMS 310 Probability and Statistics

C. Professional educational requirements:
1. MAE 301 Foundations of Secondary School Mathematics
2. MAE 302 Methods and Materials for Teaching Secondary School Mathematics
3. MAE 311 Introduction to Methods of Teaching Secondary School Mathematics
4. MAE 312 Micro-Teaching
5. MAE 447 Directed Readings in Mathematics Education
6. PSY 327 Human Growth and Development in the Educational Context
7. SSE 350 Foundations of Education
8. LIN 344 Language Acquisition and Literacy Development
9. MAE 451 Supervised Teaching — Grades 7-9
10. MAE 452 Supervised Teaching — Grades 10-12
11. MAE 454 Student Teaching Seminar

Notes:
1. To be eligible for MAE 301/311, students must have declared a major in either mathematics or applied mathematics and statistics, and the teacher education program.

2. To be eligible to student teach, students must have:
   - passed the CST (Content Specialty Test)
   - a minimum cumulative g.p.a. of 2.75;
   - a grade of C or higher but with a minimum g.p.a. of 2.75 total in: all courses required for the MAT or AMS major; AMS 310; MAT 336; MAE 301, 302, 311, 312, 447; PSY 327, SSE 350; LIN 344.
   - a minimum g.p.a. of 2.75 in the MAE courses above.

3. With the permission of the Director of Mathematics Education, a well-prepared student may substitute MAT 364 for MAT 360.

4. Students are strongly encouraged to take MAE 330, AMS 301, and a one-year sequence that uses mathematics in physics, chemistry, biology, engineering science, or economics.

Teaching English to Speakers of Other Languages (TESOL) Pre-K-12 Teacher Education Program

INTERIM PROGRAM DIRECTOR: Ximena Zate, Ph.D., P.D., Department of Linguistics

The TESOL Teacher Education Program prepares undergraduates for initial certification as Pre-K-12 teachers of English to Speakers of Other Languages. Students wishing to apply to the program should plan to major in linguistics and should consult with the program director as early as possible in their academic careers to insure completion of program requirements in a timely manner.

Requirements for Initial Certification

A. Completion of all requirements for the major in Linguistics.

B. A 3.00 g.p.a. in the major and a 2.75 g.p.a. overall.

C. Two years of college-level study of a language or languages other than English. (Completion of Skill 3 Basic Foreign Language Competence satisfies the first year of this requirement.)

D. Linguistics and foundations courses:
   - LIN 101 Introduction to General Linguistics
   - LIN 201 Phonetics
   - LIN 211 Syntax
   - LIN 301 Phonology
   - LIN 307 Introduction to Sociolinguistics
   - LIN 431 Structure of an Uncommonly Taught Language
   - Plus two additional 3 credit upper division linguistics courses

E. Professional educational requirements:
   1. PSY 327 Human Growth and Development in the Educational Context
   2. SSE 350 Foundations of Education
   3. LIN 344 Language Acquisition and Literacy Development
   4. LIN 375 TESOL Pedagogy: Theory and Practice
   5. LIN 378 Content-based Language and Literacy Development
   6. LIN 449 Field Experience I (1 credit co-requisite of LIN 375)
   7. LIN 450 Field Experience II (1 credit co-requisite of LIN 378)
   8. LIN 451 Supervised Student Teaching in TESOL (grades 7-12)
   9. LIN 452 Supervised Student Teaching in TESOL (grades P-6)
   10. LIN 454 Managing Instruction, Assessment and Resources

Note: To be eligible for LIN 375, students must have:
   1. declared a major in linguistics
   2. been accepted into the TESOL Education program
   3. received a grade of C or higher in LIN 101, 201, or 211
   4. for non-native speakers of English, received a SPEAK score of 57 or higher or TOEFL (iBT) Speaking score of 28

Engineering Chemistry (ECM)

B. Core Program
   1. CHE 301, 302 Physical Chemistry I, II
Supplement: Majors, Minors, and Programs

Requirements for the Minor in English (EGL)

The minor in English allows students to pursue, within a framework of general requirements, their specific interests in one of three areas: British literature, American literature, or 20th-century literature. Each student’s particular choice of courses within these three options must be determined in consultation with the director of undergraduate studies.

All courses offered for the minor must be passed with a letter grade of C or higher.

Completion of the minor requires 18 credits.

A. Courses required of all minors:
- EGL 204 Literary Analysis and Argumentation
- Shakespeare: EGL 243 or 345 or 346
- One elective from EGL 300-496, exclusive of 385, 386, 387, 440, 441, 451, 452, 454, and IBN courses

B. One of the following options:
1. Emphasis on British literature:
   - One survey course appropriate to the student’s interest: EGL 205 or 206 or 224
   - One course in a period of British literature: EGL 300-314
   - One course in a genre or major author in British literature: EGL 340-349, 352, 361-364

2. Emphasis on American literature:
   - One survey course appropriate to the student’s interest: EGL 217 or 218 or 226
   - One course in a period of American literature: EGL 316 or 318
   - One course in a genre or major author in American literature: EGL 350 or 352, or 361-364

3. Emphasis on 20th-century literature:
   - One survey course appropriate to the student’s interest: EGL 224 or 226
   - One course in the study of 20th-century literature: EGL 320, 321, 322 or 352
   - One course in the study of a genre treating 20th-century writers: EGL 361-364

Note: At minimum, EGL 204, an EGL survey, and a 300-level EGL course must be taken at Stony Brook.

Ecosystems and Human Impact (EHI)

Requirements for the Minor in Ecosystems and Human Impact (EHI)

The Ecosystems and Human Impact minor is intended for students who seek to complement their chosen major with a coherent set of courses emphasizing the interaction between humans and ecosystems from an interdisciplinary perspective.

No more than two courses that are used to satisfy your major can be applied to this minor. No more than one three-credit course in the minor may be taken under the Pass/No Credit option. All upper-division courses offered for the minor must be passed with a letter grade of C or higher. Completion of the minor requires 19 - 20 credits.

1. Required introductory courses:
   - SBC 111 Introduction to Sustainability
   - BIO 201 Fundamentals of Biology: Organisms to Ecosystems
   - SBC 201 Systems and Models
   - BIO 351 Ecology
   - ENV 115 Chemistry, Life, and Environment

B. Required three advanced courses chosen from the following:
   - ANP 325 Primate Behavior
   - ANP 350 Methods in Studying Primates
   - ANP 391 Ecosystem Diversity and Evolution
   - BIO 301 Sustainability of the Long Island Pine Barrens
   - BIO 351 Ecology
   - BIO 352 Ecology Laboratory
   - EHI 310 Restoration Ecology
   - EHI 311 Ecosystem-Based Management
   - EHI 322 Human Ecology
   - EHI 342 Materials in Human and Natural World
   - EHI 343 Sustainable Natural Resources
   - ENV 304 Global Environmental Change

EDP 301 The Built Environment I
EDP 302 The Built Environment II

Declaration of the Minor

Students should declare the Ecosystems and Human Impact minor no later than the middle of their sophomore year; at which time they should consult with the minor coordinator or undergraduate director and plan their course of study for fulfillment of the requirements.

Environmental Design, Policy, and Planning (EDP)

Minor in Environmental Design, Policy, and Planning (EPP)

The Environmental Design, Policy, and Planning minor is intended for students who seek to complement their chosen major with a foundation in complex scientific, legal, ethical, political, environmental, and socio-economic issues that surround the development, management, and use of the built environment.

Requirements for the Minor in Environmental Design, Policy, and Planning (EDP)

No more than two courses that are used to satisfy your major can be applied to this minor. No more than one three-credit course in the minor may be taken under the Pass/No Credit option. All upper-division courses offered for the minor must be passed with a letter grade of C or higher. Completion of the minor requires 21 credits.

1. Required four introductory courses:
   - SBC 111 Introduction to Sustainability Studies
   - SBC 113 Physical Geography
   - SBC 200 Human Settlements: History and Future
   - SBC 206 Economics and Sustainability

2. Required two advanced courses:
   - EDP 301 The Built Environment I
   - EDP 302 The Built Environment II

http://www.stonybrook.edu/ugbulletin
3. Required one advanced course from the following:
   EDP 303 Spatial Economics
   EDP 309 Planning: Policies and Regulations
   SBC 307 American Environmental History
   SBC 309 Global Environmental Politics
   SUS 350 Contemporary Topics in Sustainability

Declaration of the Minor
Students should declare the Environmental Design, Policy, and Planning minor no later than the middle of their sophomore year, at which time they should consult with the minor coordinator or undergraduate director and plan their course of study for fulfillment of the requirements.

Environmental Studies (ENS)

Requirements for the Major in Environmental Studies (ENS)

C. 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.

1. Archaeology
   ANT 104 Introduction to Archaeology
   ANT 357 The Agricultural Revolution
   ANT 362 Long Island Archaeology
   ANT 420 Environmental Analysis using Remote Sensing
   Other upper-division archaeology courses may be substituted with permission of the undergraduate program director

2. Atmospheric Studies
   ATM 205 Introduction to Atmospheric Science
   ATM 237 Global Atmospheric Change
   ATM 397 Air Pollution and its Control
   MAR 334 Remote Sensing in the Environment
   Other upper-division ATM courses (ATM 345, ATM 346, or ATM 348) may be substituted with permission of the undergraduate program director

3. Conservation/Physical Anthropology
   ANP 321 Primate Evolution
   ANP 330 Human Evolution
   ANP 360 Primate Conservation
   MAR 315 Conservation Biology and Marine Biodiversity

4. Ecology
   BIO 351 and 352 Ecology and Ecology Laboratory
   BIO 353 Marine Ecology
   BIO 354 Evolution or BIO 355 Plant Ecology
   Other upper-division ecology or marine sciences courses (e.g., MAR 320 Limnology) may be substituted for BIO 353 and BIO 354/BIO 355 with permission of the undergraduate program director

5. Environmental Economics
   ECO 303 Intermediate Microeconomic Theory
   ECO 305 Intermediate Macroeconomic Theory
   ECO 373 Economics of the Environment and Natural Resources
   One additional upper-division economics course by permission of the undergraduate director

6. Environmental History
   HIS 103 American History to 1877 or HIS 104 United States since 1877
   HIS 365 Environmental History of North America
   AAS 352 Environmental History of China
   Additional upper-division history course by permission of the undergraduate director (for example, HIS 281 or topics course)

7. Environmental Law
   ENS/POL 333 Environmental Law
   POL 320 Constitutional Law and Politics
   POL 329 Administrative Law
   Other upper-division courses (i.e., POL 351, POL 359, PHI 375) may be substituted for POL 366 with permission of the undergraduate program director

8. Marine Environmental Studies
   MAR 333 Coastal Oceanography
   MAR 336 Marine Pollution
   MAR 315 Conservation Biology and Marine Biodiversity
### Sample Course Sequence for the Major in Geosciences

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### The Science of Geology

The science of geology is focused on evaluation of the physical and chemical characteristics of the Earth and other planets and the processes that have controlled evolution of these characteristics over the vast expanse of geological time, including the present day. Geology is an interdisciplinary science that extends into applied fields such as environmental science, materials science, and remote sensing. Because of this, the major has been designed to be highly flexible, allowing students to build upon the core curriculum by selecting 15 credits of upper-level science/mathematics electives from both within and outside of the Geosciences. Students graduating with a B.S. in Geology typically go on to graduate school or obtain professional employment with environmental consulting firms or various government organizations.

### Requirements for the Major in Geology (GEO)

The major in Geology leads to the Bachelor of Science degree. All courses offered for the major must be passed with a letter grade of C or higher.

**A. Required departmental courses**

- GEO 103 The Earth Through Time
- GEO 113 Historical Geology Laboratory
- GEO 122 Physical Geology or GEO 102 The Earth and GEO 112 Physical Geology Laboratory
- GEO 306 Mineralogy
- GEO 309 Structural Geology
- GEO 310 Introduction to Geophysics
- GEO 403 Sedimentation and Stratigraphy
- GEO 407 Igneous and Metamorphic Petrology

**B. Required courses in the related sciences**

MAT 131, 132 Calculus I, II (See Note 1 below)

- CHE 131, 132 General Chemistry or CHE 141, 142 Honors Chemistry
- PHY 131/133, 132/134 Classical Physics I, II and labs or PHY 141/142 Honors Physics

**C. Related science electives**

A set of upper-division science courses, totaling 15 credits, that has been approved by the department.

**D. Upper-Division Writing Requirement**

All students majoring in Geology must submit two papers (term papers, laboratory reports, or independent research papers) to the director of undergraduate studies for Department evaluation by the end of the junior year. If this evaluation is satisfactory, the student will have fulfilled the upper-division writing requirement. If it is not, the student must fulfill the requirement before graduation.

### Notes:

1. The following alternate beginning calculus sequences may be substituted for MAT 131, 132 in major requirements or prerequisites: MAT 125, 126, 127 or 141, 142 or 171. Equivalency for MAT courses achieved by earning the appropriate score on a University mathematics placement examination will be accepted as fulfillment of the requirement without the necessity of substituting other credits. For detailed information about the various calculus sequences, see “Beginning Mathematics Courses” under the entry for the Department of Mathematics and the individual course descriptions.

2. In the Geology, Environmental Geoscience, and Engineering Geology specializations, the following physics courses are alternatives to PHY 131/133, 132/134: PHY 121/123, 122/124 or PHY 125, 126, 127 or PHY 141, 142.

### Suggested Clusters of Science Electives:

**Students with interest in Geology:**

- GEO 310 Introduction to Geophysics
- GEO 315 Groundwater Hydrology
- GEO 320 Glacial Geology
- GEO 405 Field Camp
- GEO 487 Senior Research in Geology

**Students with interest in Environmental Geoscience:**

- GEO 305 Field Geology
- GEO 315 Groundwater Hydrology
- GEO 316 Geochemistry of Surficial Processes
General Language and Literature (GER)

Requirements for the Major in German Language and Literature (GER)

The major in German Language and Literature leads to the Bachelor of Arts degree. No previous knowledge of the language is required. All courses offered for the major must be passed with a letter grade of C or higher. Transfer students must complete at least 18 credits toward the major at Stony Brook.

Completion of the major requires 36 credits.

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 to be chosen from among: GER 401 or higher; ECO 311, HUG 221, 321; HIS 311, 312; MVL 241; or POL 307
9. Upper-division writing requirement: To demonstrate proficiency in writing in German, students must present a dossier consisting of a minimum of two papers of at least five pages each. The papers must be submitted before the end of the second semester of the junior year to the director of the Department. The papers must be essays previously composed for upper-division courses in the Department. Those originally in a foreign language must be rewritten in English. A faculty committee will judge the papers for clarity, accuracy, and appropriateness of style.

If the dossier is judged to be unsatisfactory, the student will be asked to rewrite and resubmit the work in the senior year. Students must demonstrate acceptable writing skills before they graduate.

Health Science (HAV, HAN)

Courses in the Concentration

G. Disability Studies

This concentration provides an interdisciplinary focus of study in areas such as independent living, employment, adults and children with disabilities, and health and community issues. Job opportunities for entry-level professional and managerial positions may be found in developmental or physical disability services agencies, independent living centers, mental health centers, the geriatrics and vocational rehabilitation agencies.

1. HAN 443 Aging and Disability
2. HAN 446 Disability Health and Community
3. HAN 447 Children with Disabilities
4. HAN Disability and Employment
5. HAN 449 Project in Disability Studies

J. Emergency and Disaster Management: EMT – Paramedic

This concentration expands upon conventional Emergency Medical Services (EMS) training and better prepares EMS personnel for the realities of today’s workforce. Curriculum provides a foundation in the recognition and management of HAZMAT incidents, a comprehensive overview of nuclear, biological, and chemical agents that are more likely to be used as weapons of mass destruction, and an understanding of the tactics and objectives of terrorism. Students will also be trained as EMTs through a 120-hour EMT course. Graduates of this major will be the first generation of baccalaureate-prepared emergency medical technicians who are also intensely prepared in emergency and disaster management. These highly trained EMS providers will then enter our nationally recognized paramedical training major (1204 hours of study). Job opportunities may be found in private or public ambulance companies, fire departments and hospitals.

1. HAN 370 Pre hospital Care
2. HAN 472 Weapons of Mass Destruction
3. HAN 473 Emergency Response to Terrorism
4. HAN 477 HAZMAT Training for EMS
For admission requirements to the clinical concentrations, please refer to the SHTM website at www.hsc.stonybrook.edu/shtm/bshs.

K. Nuclear Medicine Technology
This new concentration was designed to educate students to meet a growing need for highly trained technologists who utilize rapidly developing technologies to image the distribution of radioactive agents in the body. Nuclear medicine is widely used for imaging bodies of patients with cardiac conditions and those with cancer. After completion of this concentration, students continue on to the post-baccalaureate program in order to be eligible to take the national registry examination. Job opportunities may be found in hospitals, physicians’ offices and diagnostic laboratories.

1. HAN 401 Radiobiology and Health Physics
2. HAN 402 Radiographic Anatomy and Pathology
3. HAN 426 Nuclear Medicine Instrumentation
4. HAN 427 Nuclear Medicine Procedures
5. HAN 429 Radiopharmacy and Therapy

For admission requirements to the clinical concentrations, please refer to the SHTM website at www.hsc.stonybrook.edu/shtm/bshs.

L. Radiologic Technology
This concentration was developed to train students to meet the growing demand for technologists who image the body through the use of radiation equipment (X-ray technology). As a member of the radiologic team, technologists capture images of bones, organs, and blood vessels as prescribed by physicians to assist in the diagnosis of diseases or injuries. After completion of this concentration, students continue on to the post-baccalaureate program in order to be eligible to take the national registry examination. Job opportunities may be found in hospitals, physicians’ offices, urgent care clinics, diagnostic laboratories and industry.

1. HAN 401 Radiobiology and Health Physics
2. HAN 402 Radiographic Anatomy and Pathology
3. HAN 404 Radiology Instrumentation
4. HAN 405 Radiographic Technique
5. HAN 406 Radiographic Procedures and Positioning I

For admission requirements to the clinical concentrations, please refer to the SHTM website at www.hsc.stonybrook.edu/shtm/bshs.

M. Anesthesiology Technology
Designed to provide students with knowledge and skills for entry-level non-clinical positions in the field of anesthesiology technology. Upon graduation, students may apply for admission to the 10-month, post-baccalaureate hospital-based Anesthesiology Technology program, which prepares students as entry-level members of anesthesia teams. Consult the Health Sciences Center Bulletin for admission requirements.

1. HAN 434 Corporate Compliance and Regulation
2. HAN 481 Intro. to Anesthesia
3. HAN 483 Cardiopulmonary Physiology for ASATT
4. HAN 485 Clinical Monitoring
5. HAN 489 Pharmacology for ASATT

For admission requirements to the clinical concentrations, please refer to the SHTM website at www.hsc.stonybrook.edu/shtm/bshs.

Respiratory Care
1. Students completing the courses at Stony Brook should take BIO 203 and 204 Fundamentals of Biology.
2. Preference is given to students who have completed science requirements within the last ten years.

Grammar Immersion
To progress in the major or minor program, students must pass a grammar proficiency test as part of JRN 111, a grammar course that is co-requisite with JRN 110. The grammar course includes an eight-week immersion lab in grammar, punctuation, and sentence structure. In the ninth week, all students take a proficiency test. Those who pass are excused from the lab for the rest of the semester. All other students must continue attending the lab and will be required to take a second test on the last day of class. Satisfactory/Unsatisfactory grading only. Students must receive a Satisfactory grade in JRN 111 in order to continue in journalism skills courses.
Korean Studies (KOR)

Requirements for the Minor in Korean Studies (KOR)

Completion of the minor requires 18 credits. Only one course under S/U credit option and no more than three language courses can be used to fulfill the requirements.

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
   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 311 Advanced Korean I
   KOR 312 Advanced Korean II
   KOR 331-F Social Sciences Topics in Korean Studies
   KOR 332-G Humanities Topics in Korean Studies
   KOR 351 Studies in Korean Literature
   KOR 411 Advanced Korean III
   KOR 412 Advanced Korean IV
   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.

Leadership Development (LDR)

The environment into which graduating seniors enter is a diverse and competitive one. In addition to being well grounded academically, the next generation of leaders must have a solid understanding of effective leadership strategies to motivate and direct the work of others in a meaningful way. The goal of the minor is to allow Stony Brook students with an interest in leadership to better prepare for their chosen professions by incorporating multidisciplinary theory and competencies into their lives.

Courses Offered in Leadership Development

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

LDR 210 Principles of Leadership
LDR 310 Case Studies in Leadership
LDR 410 Senior Seminar in Leadership

General LDR Minor Requirements

1. Before declaring the minor, each student should plan his or her program with the director of the minor.
2. All credits for the minor must be passed with a grade of C or higher.
3. Students in the College of Leadership and Service are strongly encouraged to consider the minor in Leadership Development, but it is not mandatory.
4. Students who are not residents of the LDS college are welcome to take the minor.
5. Students taking the LDR minor are expected to participate in LLC activities.

Requirements for the Minor in Leadership Development (LDR)

Completion of the minor requires 21 credits.

1. LDR courses: 9 credits from these 3 courses
   LDR 210-Principles of Leadership
   LDR 310-Case Studies in Leadership
   LDR 410-Senior Seminar in Leadership
2. Practicum (Done in conjunction with LDR 410)
   With the approval of the faculty Director, students will participate in experiential learning in one of two ways: a) leadership of a project or comprehensive task or b) being mentored by an established leader. Both models require active participation in true leadership activities such as development of vision and strategy.
3. Electives (12 credits)
   The course designator of each selected course must be different from the designator associated with any of the student’s majors or minors. For example, a student majoring or minoring in Business Management major cannot select any BUS courses, and a student majoring or minoring in Political Science major cannot select any POL courses. In addition, no more than 2 electives may have the same designator (including cross-listed courses). This is a list of courses appropriate to the minor. The Faculty Director may choose to modify this list.
   AFS/HIS 277 Modern Color Line
   AFS/HIS 325 Civil Right Movement
   BUS 111 Business in the 21st Century
   BUS 301 Corporate Communication
   EGL/HUR 232 Rebels and Tyrants
   HIS 104 U.S. since 1877
   INT 201 Democracy & Capitalism
   LCR 200 Nature of Community
   POL 101 World of Politics
   POL 102 Intro. To American Government
   POL 322 The Presidency in the American Political System
   POL 323 U.S. Congress
   POL 324 American Political Parties and Pressure Groups
   POL 325 Civil Liberties and Civil Rights
   POL 364 Organizational Decision Making
   POL 374 Global Issues in the United Nations
   POL 434 Supreme Court Decision Making
   SOC 336 Social Change
   WST/POL 347 Women and Politics
Mechanical Engineering (MEC)

Requirements for the Minor in Mechanical Engineering (MEC)

1. Four required courses:
   - MEC 260 Engineering Statics
   - MEC 262 Engineering Dynamics
   - MEC 301 Thermodynamics
   - MEC 363 Mechanics of Solids

2. Two elective courses chosen from the following:
   - MEC 125 Fundamentals of Machining
   - MEC 305 Heat and Mass Transfer
   - MEC 310 Introduction to Machine Design
   - MEC 320 Engineering Design Methodology and Optimization
   - MEC 325 Manufacturing Processes and Machining
   - MEC 364 Introduction to Fluid Mechanics
   - MEC 396 Engineering Fluid Mechanics
   - MEC 398 Thermodynamics II
   - MEC 402 Mechanical Vibrations
   - MEC 411 System Dynamics and Control

Note: Other electives require the approval of the undergraduate program director.

Nanotechnology Studies (NTS)

Completion of the minor requires 18-22 credits and consists of the following requirements:

1. BME 213 or ESM 213 or EST 213 or MEC 213
2. Two semesters (at least 6 credits) of independent research (499 or 488), co-advised by a faculty members from the student's major program and a second faculty advisor from the NTS faculty committee.
   Research topics must be approved by both faculty advisors for courses to be accepted to the NTS minor.
3. Two technical electives, chosen from among the following courses:
   a. BME 381 Nanofabrication in Biomedical Applications

South Asian Studies (SOA)

Completion of the minor requires seven courses or 21 credits.

1. AAS 201 Introduction to the Civilization of the Indian Subcontinent
2. AAS 338 Contemporary India: History, Politics, and Diplomacy
3. One of the following:
   a. AAS/RLS 256 Hinduism
   b. AAS/RLS 260 Buddhism
   c. AAS/RLS 280 Islam
4. Three of the following:
   a. AAS 110 Appreciating Indian Music
   b. AAS 209 Indian Classical Dance
   c. AAS 212 Asian and American Studies Topics in the Humanities (appropriate topic only)
   d. AAS/LIN 250 Languages and Cultures of Asian Americans
   e. AAS 320 Literature of India
   f. AAS 330 Language and Society in South Asia
   g. AAS 326 Indian Mythology
   h. AAS 327 Great Epics of India: Ramayana and Mahabharata
   i. AAS/PHI 386 Topics in Asian Philosophy
5. One additional course (a minimum of 3 credits) chosen from the following:
   a. AAS 211 Asian and American Studies Topics in the Social Sciences (appropriate topic only)

Sustainability Studies (SUS)

Minor in Sustainability Studies (SUS)

The Sustainability Studies minor is intended for students who seek to complement their chosen major with a foundation in the social, economic, and environmental aspects of sustainability.

Requirements for the Minor in Sustainability Studies (SUS)

No more than two courses that are used to satisfy your major can be applied to this minor. No more than one three-credit course in the minor may be taken under the Pass/No Credit option. All upper-division courses offered for the minor must be passed with a letter grade of C or higher. Completion of the minor requires 18 credits.

1. Required three introductory courses:
COURSE DESCRIPTIONS

2. Required three courses from the following:
   - SUS 301 Environmental Ethics
   - SUS 306 Business and Sustainability
   - SUS 307 Environmental Economics and Management
   - SUS 308 Economic Development
   - ENV 340 Contemporary Topics in Environmental Science
   - EPD 303 Spatial Economics
   - SBC 307 Environmental History of North America
   - SBC 309 Global Environmental Politics
   - SBC 310 Migration, Development and Population Redistribution
   - SBC 311 Disasters and Society: A Global Perspective
   - SBC 312 Environment, Society, and Health
   - SBC 320 Sub-Saharan Africa: Geography, Culture, and Society
   - SUS 305 Collective Action and Advocacy
   - SUS 341- Environmental Treatises and Protocols
   - SUS 350- Contemporary Topics in Sustainability
   - EHI 311 Ecosystem-Based Management

One of the following four courses:
   - SBC 104 Moral Reasoning and Ethics
   - SBC 115 Introduction to Human Demography
   - POL 302 Introduction to American Government
   - ENV 115 Chemistry, Life, Environment

2. Required three courses from the following:
   - SUS 301 Environmental Ethics
   - SUS 306 Business and Sustainability
   - SUS 307 Environmental Economics and Management
   - SUS 308 Economic Development
   - ENV 340 Contemporary Topics in Environmental Science
   - EPD 303 Spatial Economics
   - SBC 307 Environmental History of North America
   - SBC 309 Global Environmental Politics
   - SBC 310 Migration, Development and Population Redistribution
   - SBC 311 Disasters and Society: A Global Perspective
   - SBC 312 Environment, Society, and Health
   - SBC 320 Sub-Saharan Africa: Geography, Culture, and Society
   - SUS 305 Collective Action and Advocacy
   - SUS 341- Environmental Treatises and Protocols
   - SUS 350- Contemporary Topics in Sustainability
   - EHI 311 Ecosystem-Based Management

Declaration of the Minor

Students should declare the Sustainability Studies minor no later than the middle of their sophomore year, at which time they should consult with the minor coordinator or undergraduate director and plan their course of study for fulfillment of the requirements.

Technological Systems Management (TSM)

Requirements for the Major in Technological Systems Management (TSM)

1. Required courses (11)
   - 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
   - EST 213 Studies in Nanotechnology
   - EST 304 Communication for Engineers and Scientists
   - EST 310 Design of Computer Games
   - EST 320 Communication Technology Systems
   - EST 323 Human Computer Interaction
   - EST 331 Ethics and Intellectual Property
   - EST 341 Treatment Technologies

Note: Students make take other 300 or 400 level courses in their area of specialization with the approval of the Undergraduate Program Director.

Women’s Studies (WST)

Specialization in Gender and Social Change

Students choosing to pursue this specialization receive additional preparation for a career in social change creating professions, such as law, social work, public policy, or the media. Depending on the student’s choice of courses, this specialization can be useful for students planning careers in civil rights work, community organizing, work with abused women and children, politics, or visual media, to give only a few examples.

Requirements for the Specialization in Gender and Social Change

1. 18 credits of coursework (See Notes)

   See the list of elective courses below; a current list of courses approved for this specialization can be found on the WST community blackboard Web site at http://blackboard.stonybrook.edu.

2. Internship

   Three of the 18 credits for the specialization must be in an approved internship or other related applied experience.

   Notes:
1. No more than 3 of the 18 credits required for the specialization may be lower-division.
2. All A-F graded courses must be passed with a grade of C or better.
3. The specialization courses may overlap with major requirements, but not replace any.

Requirements for the Minor in Women's Studies (WST)

Only one course (no more than three credits) offered for the minor may be taken for Pass/No Credit, and no more than 6 credits may be taken for S/U. At least 15 credits must be graded with a letter grade (A through F).

Completion of the minor requires 21 credits.

1. WST 102 Introduction to Women's Studies in the Social Sciences or WST 103 Women, Culture, and Difference
2. WST 301 Histories of Feminism
3. WST 407 Senior Research Seminar for Women's Studies Minors
4. Twelve credits chosen from among WST courses (or their crosslisted equivalents) and the list in WST major requirement C above. At least six of these credits must be numbered 300 or above. It is strongly recommended that these courses be chosen from among the following options: WST 390-G, 391-G, 392-H, 393-I, 394-H, 395-J, 396-K&4, 397-F, 398-K, or 399-G.

Elective courses for the Specialization in Gender and Social Change

WST 310 Contemporary Feminist Issues
WST 377/PSY 347 Psychology of Women
WST 391 Music and Sexuality
WST 392 Cultures of Disability
WST 394 Social Issues in Human Reproduction
WST 395 Feminist Theory in a Global Context
WST 395 Issues in Transnational Feminism
WST 395 Global Activism
WST 395 Global Feminism: Maids, Nannies & Sex Workers & Today's Feminism
WST 396/HIS 396 Women, Utopia & Dystopia
WST 396/HIS 396 Women and Social Welfare
WST 397 Applied Developmental Psychology Of Gender
WST 398 Gender & Social Movements
WST/SOC 247 Sociology of Gender
LHD 301 Men in American Society
LHD 301 Gender & Technology
LHD 401 Gender and Contemporary Media
LHD 401 Gender & Body Image
WST/SOC 247 Sociology of Gender
WST/POL 330 Gender & Law
WST/SOC 340 Sociology of Reproduction
WST/SOC 347 Gender & Politics
WST/AFS 350 Black Women & Social Change
WST/SOC 371 Gender & Work
AAS 392 Gender & Caste in Hindu Law
Fall 2008 Updates

Africana Studies (AFS)

Requirements for the Major in Africana Studies (AFS)
The major in Africana Studies leads to the Bachelor of Arts degree. All courses for the major, except those graded S/U, must be passed with a letter grade of C or higher.

Completion of the major requires 39 credits, including at least 21 upper-division credits (from courses numbered 300 or higher). Courses taken pass/fail with an AFS or AFH designator (283, 475, 476, and 488) are considered enhancements to the major experience but do not count towards major requirements. They may fulfill university requirements.

1. Foundation Courses
   AFS 101, 102 Themes in the Black Experience I, II

2. Two courses from each of the following areas (at least two courses selected from 200-level courses, and at least five upper-division courses at the 300 or 400-level):
   a. Africana Studies in the Humanities
      AFS 206 Great Books of the Black Experience
      AFH/EGL 249 African-American Literature and Music in the 19th and 20th Centuries
      AFS 329/HUF 318 Pan-African Literature
      AFH 330 Pan-African Literature II
      AFH/EGL 368 Caribbean and American Connections in Literature
      AFS/HUF 385 French Caribbean Literature
   b. Africana Studies in the Social Sciences
      AFS/HIS 221 Introduction to Modern African History
      AFS 239 Introduction to the Caribbean Experience
      AFS 240 Issues in Caribbean Society
      AFS/HIS 277 The Modern Color Line
      AFS/SOC 365 Introduction to African Society
      AFS 372 African American Political Thought
      AFS/ANT 395 Religions of the Caribbean
      c. The African American Experience
         AFS 300 Blacks in the City
         AFS 310 American Attitudes Toward Race
         AFS 319 The Politics of Race
         AFS/HIS 325 The Civil Rights Movement
         AFS/HIS 339 Recent African American History
         AFS/WST 350 African American Women and Social Change
         AFS 360 African American Social Commentary
         AFS 363 The Media and Black America
         AFS 370 The African American Family
         AFS 375 Slavery
         AFS 392 The Black Power Movement
         AFS 394 Black Nationalism in America
         d. The Global African Experience
            AFH/PHI 379 Philosophy of Race
            AFS 345 Culture and Gender: Women in Africa and the Caribbean
            AFS/POL 337 The Politics of Africa
            AFS 339/ARH 329 Arts of the African Diaspora
            AFS/HIS 346 Political and Social History of Africa
            AFS/ANT 380 Race and Ethnicity in Latin America and the Caribbean
            AFS/WST 381 AIDS, Race, and Gender in the Black Community
            AFS/HIS 388 Slavery in Latin America and the Caribbean
            AFS 393 Caribbean Immigrants in U.S.
            AFS 400 Ancient Egypt (KMT): Historical and Contemporary Views
      3. Three credits in AFH or AFS 447 Readings in Africana Studies or AFH or AFS 487 Research in Africana Studies taken in the junior or senior year. Seniors are required to present their research orally to the AFS faculty.
      4. Two additional AFS or AFH courses at the 300 or 400 level, or two upper-division courses outside of the department (approval of the undergraduate studies director is necessary when taking courses outside of the department for major credit).

5 Upper-Division Writing Requirement
Africana Studies Majors are required to submit a writing sample completed for an upper-division course in the Africana Studies Department and must submit evaluation forms signed by a professor with grades of B or higher. Students must inform the instructor of the courses in advance of their plan to use the paper(s) in fulfillment of the writing requirement for the major. A minimum of 15 pages of material must be submitted.

Notes:
1. Students are recommended, but not required, to take AFS 491 Interdisciplinary Seminar.
2. Students must take at least two 200-level courses in Africana Studies prior to beginning their junior year.
3. Only six credits of directed readings or independent study courses (courses numbered 447 and 487) may be used toward the major.
4. The following courses may not be used to fulfill major requirements: AFS 283, 475, 476, 488; AFH 475, 476.
5. Transfer students must take at least 12 credits of upper-division Africana Studies courses in residence at Stony Brook to complete the AFS major.

Departmental Honors Program
Departmental majors with a minimum G.P.A. of 3.33 in Africana Studies courses as specified in the major requirements and an overall G.P.A. of 3.0 are eligible to enroll in the Africana Studies Honors program at the beginning of their senior year.

The student must submit a proposal to the Department indicating the merit of the proposed research after asking a faculty member to be a sponsor for the project. This should be done in the semester prior to beginning the project. The faculty sponsor must submit a statement of support for the proposal.

The resulting project is read and evaluated by a committee consisting of the faculty sponsor and two faculty members (one may be a member of a department outside of Africana Studies). If the honors project is completed successfully, honors are conferred.

Requirements for the Minor in Africana Studies (AFS)

http://www.stonybrook.edu/ugbulletin
The minor in Africana Studies is intended for students interested in exploring aspects of the Black experience in ways that relate to their own major field of study. The sequence of lower- and upper-division courses gives the student a well-balanced analysis of the varied aspects of the African and African American experience. All courses offered for the minor, except those graded S/U, must be passed with a letter grade of C or higher.

Completion of the minor requires 21 credits, including 12 upper-division credits.

1. AFS 101, 102 Themes in the Black Experience I, II
2. One course from each of the following areas (see above):
   a. Africana Studies in the Humanities
   b. Africana Studies in the Social Sciences
   c. The African-American Experience
   d. The Global African Experience
3. One additional upper-division course selected from one of the areas listed in requirement 2.
4. Three credits in AFH or AFS 447 Readings in Africana Studies or AFH or AFS 487 Research in Africana Studies taken in the junior or senior year.

Biomedical Engineering (BME)

Sample Course Sequence for the Major in Biomedical Engineering

**Freshman Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>First Year Seminar 101</td>
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<tr>
<td>D.E.C.</td>
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<tr>
<td>AMS 151</td>
<td>3</td>
</tr>
<tr>
<td>CHE 131</td>
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<td>BME 100</td>
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**Spring**

<table>
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<tr>
<th>Course</th>
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<td>First Year Seminar 102</td>
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<td>ESG 111</td>
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<tr>
<td>AMS 161</td>
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</tr>
<tr>
<td>CHE 132</td>
<td>4</td>
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<tr>
<td>PHY 132/134</td>
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<tr>
<td>MEC 203</td>
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**Sophomore Fall**

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<td>MEC 260</td>
<td>3</td>
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<tr>
<td>BIO 202</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C. or BME 212</td>
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</tr>
<tr>
<td>AMS 210</td>
<td>3</td>
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</table>

Requirements for the Major in Biomedical Engineering (BME)

The curriculum begins with a focus on basic mathematics and the natural sciences followed by courses that emphasize engineering science and bridging courses that combine engineering science and design. The sequence of courses culminates with a one-year design experience that integrates the science, engineering, and communication knowledge acquired. The technical electives and additional courses are chosen in consultation with a faculty advisor, taking into consideration the particular interest of the student.

Completion of the major requires approximately 130 credits.

1. **Mathematics**
   a. AMS 151, 161 Calculus I, II

   b. AMS 261 or MAT 203 or MAT 205 Calculus III

   c. AMS 361 or MAT 303 or MAT 305 Calculus IV

   d. AMS 210 Matrix Methods and Models

   e. AMS 310 Survey of Probability and Statistics

   Note: The following alternate calculus course sequences may be substituted for AMS 151, 161:

   MAT 125, 126, 127 or MAT 131, 132 or MAT 141, 142 or MAT 171

2. **Natural Sciences**
   a. BIO 202 Fundamentals of Biology: Molecular and Cellular Biology or BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
   b. CHE 131, 132 General Chemistry I, II
   c. PHY 131/133, 132/134 Classical Physics I, II with labs

   Note: The following alternate science sequences may be substituted:

   PHY 125, 126, 127, or PHY 141, 142 in lieu of PHY 131/133, 132/134 CHE 141, 142, in lieu of CHE 131, 132

3. **Computers and Programming**
   a. ESG 111 C Programming for Engineers
   b. ESE 124 Computer Techniques for Electronic Design
   c. CSE 130 Introduction to Programming in C

4. **Engineering**
   a. MEC 260 Engineering Statics
   b. MEC 262 Engineering Dynamics
   c. ESE 271 Electrical Circuit Analysis I

5. **Biomedical Engineering**
   a. BME 100 Introduction to Biomedical Engineering
   b. BME 212 Laboratory Methods in Biomedical Engineering
   c. BME 301 Bioelectricity
   d. BME 304 Genetic Engineering
   e. BME 305 Biofluids
   f. BME 440 Biomedical Engineering Design
**Chemical and Molecular Engineering (CME)**

**Sample Course Sequence for the Major in Chemical and Molecular Engineering**

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<thead>
<tr>
<th>Freshman Fall</th>
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<tr>
<td>CME 101</td>
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<td>CHE 131, 133</td>
<td>4, 1</td>
</tr>
<tr>
<td>ESG 111</td>
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**Spring Credits**

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<tbody>
<tr>
<td>First Year Seminar 102</td>
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<tr>
<td>D.E.C.</td>
</tr>
<tr>
<td>AMS 161</td>
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<tr>
<td>CHE 132, 134</td>
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<td>PHY 131, 133</td>
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**Sophomore Fall Credits**

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<td>AMS 261</td>
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<td>CHE 383</td>
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<td>CME 304</td>
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<td>PHY 132, 134</td>
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**Spring Credits**

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<tbody>
<tr>
<td>AMS 361</td>
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<td>CHE 326</td>
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<tr>
<td>CHE 384</td>
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<td>CME 312</td>
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<td>CME 314</td>
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**Junior Fall Credits**

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</tr>
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**Spring Credits**

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<tbody>
<tr>
<td>CME 322</td>
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<td>CME 322</td>
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<td>CME 333</td>
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**Senior Fall Credits**

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<td>CME 440</td>
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**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.

Completion of the major requires approximately 117 credits.

1. **Mathematics**
   a. AMS 151, 161 Applied Calculus I, II
   b. AMS 261 or MAT 203 or MAT 205 Calculus III
   c. AMS 361 or MAT 303 or MAT 305 Calculus IV

   Note: The following alternate calculus course sequences may be substituted for AMS 151, 161:
   - MAT 161, MAT 162
   - MAT 181, MAT 182

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
   - 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 Introduction to the Solid State

   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**
   - CSE 130 Introduction to Programming in C
   - ESG 111 C Programming for Engineers
   - ESE 124 Computer Techniques for Electronic Design

4. **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 for Chemical Engineering Analysis
   - CME 318 Chemical Engineering Fluid Mechanics
   - CME 322 Chemical Engineering Heat and Mass Transfer
   - CME 323 Reaction Engineering and Chemical Kinetics
   - CME 327 Molecular Modeling for Chemical Engineers or 300-level BUS course
   - CME 330 Principles of Engineering for Chemical Engineers
   - CME 333 Business Economics for Engineers
   - CME 401 Separation Technologies
   - CME 310, 320, 410, 420 Chemical Engineering Laboratory I, II, III, IV
5. Specializations in Chemical and Molecular Engineering

Chemical and Molecular Engineering students must choose from one of the eight specializations offered. Each specialization requires the completion of four technical elective courses at the 300 level or higher.

6. Upper-Division Writing Requirement: CME 300 Writing in Chemical and Molecular Engineering

All degree candidates must demonstrate skill in written English at a level acceptable for engineering majors. All Chemical and Molecular Engineering students must complete the writing course CME 300 concurrently with CME 310. The quality of writing in technical reports submitted for CME 310 is evaluated, and students whose writing does not meet the required standard are referred for remedial help. Satisfactory writing warrants an S grade for CME 300, thereby satisfying the requirement.

Grading

All courses taken to satisfy requirements 1-6 above 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

Students must complete four courses in a chosen specialization. (In some cases, there is also a pre- or co-requisite course attached to one of the courses.) In consultation with a faculty advisor, students select their area of specialization before registering for the first semester of the junior year and not later than upon earning 57 credits. Students are urged to meet regularly with their advisors regarding completion of the course requirements for the chosen specialization. Other courses may be used towards this requirement with the prior permission of the undergraduate program director.

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

B. Materials Science

Provides a foundation in properties of materials, engineering mechanics, and electronic materials for students interested in computer-related industries, nanotechnology, and electronics.

ESG 333 Materials Science II: Electronic Properties
ESM 334 Materials Engineering
ESM 335 Strength of Materials
ESM 336 Electronic Materials

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.

CME 309 Polymers
CME 370 Cellular Biology for Chemical Engineers
CME 371 Biomedical Polymers
CME 470 Polymer Synthesis

Cinema and Cultural Studies (CCS)

Requirements for the Major in Cinema and Cultural Studies (CCS)

The major in Cinema and Cultural Studies leads to the Bachelor of Arts degree. All courses offered for the major must be passed with a letter grade of C or higher. Twenty-one credits for the major must be earned in courses numbered 300 or higher. Completion of the major requires 39 credits.

A. Core Courses

CCS 101 Images and Texts: Understanding Culture
CCS 201 Writing about Culture
CCS 301 Theorizing Cinema and Culture
CCS 401 Senior Seminar in Cinema and Cultural Studies

B. Courses in Cinema

1. Required:
   - HUM 201 Film Genres and History
   - HUM 202 Film History

2. One other lower-division course from the following:
   - CLT 235 American Pluralism in Film and Literature
   - HUF 211 French Cinema
   - HUG 221 German Cinema Since 1945
   - HUI 231 Sex and Politics in Italian Cinema
   - HUM 220 Cross-Cultural Encounters
   - HUR 241 Russian Cinema
   - THR 117 Media Analysis and Criticism

3. Three upper-division courses from the following:
   - CCS 311 Gender and Genre in Film
   - CCS 312 Cinema and the Ancient World
   - CCS 390 Latin American Cinema
   - CCS 391 Contemporary African Cinema and Cultural Studies
   - CCS 392 American Cinema and Cultural Studies
   - CCS 393 European Cinema and Cultural Studies
   - CCS 394 Asian Cinema and Cultural Studies
   - CCS 487 Independent Research
   - CCS 488 Internship
   - CLT 335 Interdisciplinary Study of Film
   - SPN 420 Topics in Spanish and Latin American Cinema
   - THR 403 Media Theory and Criticism

C. Courses in Cultural Studies

1. Texts and Contexts. One course from the following:
   - CLT 361 Literature and Society
   - CLT 362 Literature and Ideas
   - CLT 363 Literature and the Arts
   - CLT 391 African Contemporary Literature
   - CLT 392 Multicultural Comparative Literature
   - CLT 393 European Comparative Literature
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS

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CLT 394 Asian Comparative Literature

2. Visual Culture. One course from the following:
   ARH 322 American Art
   ARH 329/AFH 339 Arts of the African Diaspora
   ARH 331 American Art to 1890
   ARH 333 Arts for the Public
   ARH 335 History of Photography
   ARH 342 Art of the 20th Century

   Visual Culture. One course from the following:
   ARH 322 American Art Since 1947
   ARH 329/AFH 339 Arts of the African Diaspora
   ARH 331 American Art to 1890
   ARH 333 Arts for the Public
   ARH 335 History of Photography
   ARH 342 Art of the 20th Century

3. Digital Culture. One course from the following:
   ARS/MUS/THR 317 Interactive Performance, Media, and MIDI
   ARS/MUS/THR 318 Music and the Moving Image
   ARS 325 Theory and Practice of Electronic Media: Print
   ARS 326 Theory and Practice of Electronic Media: Video and Animation
   ARS 327 Web Art, Design, and Culture
   ARS 425 Advanced Digital Arts
   CCS 313 Television Studies
   CCS 395 Digital Cultural Studies
   MUS 300 Music, Technology, and Digital Culture
   MUS 340 Introduction to Music Technology
   MUS 437 Electronic Music

   Requirements for the Minor in Cinema and Cultural Studies (CCS)
   All courses for the minor must be passed with a letter grade of C or higher.

   Completion of the minor requires 21 credits.
   A. CCS 101 Images and Texts: Understanding Culture
      or CCS 201 Writing about Culture
   B. HUM 201 Film and Television Studies: Genres
      or HUM 202 Film and Television Studies: History and Theory
   C. Two courses from the following:
      ARH 322, ARH 329, ARH 331, ARH 333, ARH 335, ARH 342,
      ARS/MUS/THR 317, ARS/MUS/THR 318, ARS 325, ARS 326,
      ARS 327, ARS 425, MUS 300, MUS 340, CCS 313, CCS 395, CLT 390, CLT 391, CLT 392, CLT 393, CLT 394

   Comparative Literature (CLT)

   Requirements for the Major in Comparative Literature (CLT)
   The interdisciplinary major in Comparative Literature leads to the Bachelor of Arts degree. All courses offered for the major must be taken for a letter grade. All upper-division courses offered for the major must be passed with a grade of C or higher.

   Completion of the major requires 36 credits.
   A. Introduction
      Two courses that survey a literary theme historically and cross-culturally, selected from the following:
      HUM 109 Philosophy and Literature in Social Context
      HUM 121 Death and Afterlife in Literature
      HUM 122 Images of Women in Literature
      HUM 123 Sin and Sexuality in Literature

   B. Background
      Three courses beyond the introductory level, chosen from the following:
      CLT 215, CLT 211, 212, 220, 266
      or one course per designator from the following:
      EGL 200-level, F RN 395, 396, ITL 395, 396, GER 344, HUR 341, JDH 261
      or one of the following classical language courses: LAT 112 or SKT 112

   C. Literature in the Original Language
      At least one course in literature in its original language (other than English)

   D. Theory
      CLT 301 Theory of Literature
      or CCS 301 Theorizing Cinema and Culture

   E. Advanced Study
      Four upper-division courses, at least one from each of groups 1 and 2:
      Group 1:
      CLT 331 Literary Genres: Poetry
      CLT 332 Literary Genres: Drama
      CLT 333 Literary Genres: Novel
      CLT 334 Other Literary Genres
      CLT 391 African Contemporary Literature
      CLT 392 Multicultural Comparative Literature
      CLT 393 European Comparative Literature
      CLT 394 Asian Comparative Literature

   Group 2:
      CCS 311 Gender and Genre in Film
      CCS 312 Cinema and the Ancient World
      CCS 313 Television Studies
      CCS 390 Latin American Cinema
      CCS 391 Contemporary African Cinema and Cultural Studies
      CCS 392 American Cinema and Cultural Studies
      CCS 393 European Cinema and Cultural Studies
      CCS 394 Asian Cinema and Cultural Studies
      CCS 395 Digital Cultural Studies

   Requirements for the Minor in Comparative Literature (CLT)
   The minor in Comparative Literature is designed especially to interest students majoring in a foreign language, English, and other humanities fields. It provides a broad overview of the theory and techniques of comparative study, and an opportunity for the student to bring comparative breadth to his or her major field of study.

   Completion of the minor requires 21 credits.
   A. Introduction
      One course that surveys a literary theme historically and cross-culturally, selected from the following:
      HUM 109 Philosophy and Literature in Social Context
      HUM 121 Death and Afterlife in Literature
      HUM 122 Images of Women in Literature
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS

Spring 2009: updates since Spring 2007 are in red

HUM 123 Sin and Sexuality in Literature

B. Background
Two courses beyond the introductory level, chosen from the following:
- CLS 215, CLT 211, 212, 220, 266
- one course per designator from the following: EGL 200-level, FRN 305, 306, TTL 305, 306, GER 344, HUR 341, JDI 261
- or one of the following classical language courses: LAT 112 or SKT 112

C. Literature in the Original Language
At least one course in literature in its original language (other than English)

D. Theory
- CLT 301 Theory of Literature
- or CCS 301 Theorizing Cinema and Culture
- or EGL 365 Literary Criticism and Theory

E. Advanced Study
Two upper-division courses, one from group 1, and one from group 2:
Group 1:
- CLT 331 Literary Genres: Poetry
- CLT 332 Literary Genres: Drama
- CLT 333 Literary Genres: Novel
- CLT 334 Other Literary Genres
- CCS 391 Contemporary African Cinema and Cultural Studies
- CCS 392 American Cinema and Cultural Studies
- CCS 393 European Cinema and Cultural Studies
- CCS 394 Asian Cinema and Cultural Studies

Group 2:
- CLT 335 Interdisciplinary Study of Film
- CLT 361 Literature and Society
- CLT 362 Literature and Ideas
- CLT 363 Literature and the Arts
- CCS 311 Gender and Genre in Film
- CCS 312 Cinema and the Ancient World
- CCS 313 Television Studies
- CCS 390 Latin American Cinema
- CCS 391 Contemporary African Cinema and Cultural Studies
- CCS 392 American Cinema and Cultural Studies

Computer Engineering (ECE)

Requirements for the Major in Computer Engineering (ECE)

7. Engineering Technical Electives
4 ESE electives chosen from:
- ESE 311 Analog Integrated Circuits
- ESE 319 Electromagnetism and Transmission Line Theory
- ESE 330 Integrated Electronics
- ESE 337 Digital Signal Processing Theory
- ESE 344 Software Techniques for Engineers
- ESE 346 Computer Communications
- ESE 347 Digital Signal Processing
- ESE 349 Introduction to Fault Diagnosis of Digital Systems
- ESE 355 VLSI System Design
- ESE 356 Digital System Specification and Modeling
- ESE 357 Digital Image Processing
- ESE 358 Computer Vision
- ESE 360 Network Security Engineering
- ESE 366 Design using Programmable Mixed-Signal Systems-on-Chip
- ESE 381 Embedded Microprocessor Systems Design II
- ESE 476 Undergraduate Instructional Laboratory Development Practicum

Transfer Credits
Students wishing to transfer credits for courses equivalent to CSE 114, 214, or CSE 215 in order to use them as prerequisites for other CSE courses or toward meeting the requirements for acceptance into the major must demonstrate proficiency in the course material by passing a proficiency examination, given during the first week of each semester.

Enrolling in CSE Courses
To enroll in CSE courses, students must:
Have completed all prerequisites with a grade of C or higher. (Pass/No Credit grades are not acceptable to meet prerequisites.) For transfer students, official transfer credit evaluations must have been completed and approved and the relevant proficiency examination for lower division courses, given during the first week of each semester, must have been taken and passed.
Failure to satisfy the prerequisites or to attend the first class may result in deregistration. The Pass/No Credit option is not available to CSE majors for CSE courses.

Requirements for the Major in Computer Science (CSE)

The major in Computer Science leads to the Bachelor of Science degree. At least five upper-division courses from items 2 and 3 below must be completed at Stony Brook.

Completion of the major requires approximately 80 credits.

1. Required Introductory Courses
- CSE 114 Computer Science I
- CSE 214 Computer Science II
- CSE 215 Foundations of Computer Science
- CSE 219 Computer Science III
- CSE 220 Computer Organization and Systems

2. Required Advanced Courses
- CSE 302 Professional Ethics for Computer Science (Effective fall 2005)
- CSE 303 Introduction to the Theory of Computation and CSE 373 Analysis of Algorithms
- CSE 308 Software Engineering

Three software-related courses chosen from: CSE 305; 306; 304 or 307; 328 or 333

One hardware-related course chosen from: CSE 310, 320, 346, ESE 345

3. Computer Science Electives
Three upper-division CSE or ISE course electives excluding CSE 475, 488, 495, and 496.

4. AMS 151, 161 Applied Calculus I, II
Note: The following alternate calculus course sequences may be substituted for AMS 151, 161 in major requirements or prerequisites: MAT 125, 126, 127, or MAT 131, 132, or MAT 141,
The minor in Computer Science is open to all students not majoring in either Computer Science or Information Systems or minoring in Information Systems. To declare the minor in Computer Science, students must complete CSE 113 and 114 with grades of C or higher. The minor requires seven CSE or ISE courses totaling 22 to 24 credits as outlined below.

1. CSE 114 Computer Science I
2. CSE 214 Computer Science II
3. CSE 215 Foundations of Computer Science
4. CSE 219 Computer Science III or CSE 220 Computer Organization and Systems Programming
5. Three upper-division CSE or ISE courses totaling at least nine credits (excluding CSE/ISE 300, 475, 487, 488).

Note: All of these courses must be passed with a letter grade of C or higher.

Cytotechnology

The Cytotechnology major has been removed from the majors offered through the Schools of Health Sciences.

Cytotechnology

Cytotechnologists are skilled laboratory scientists who employ microscopic and other analytic methods to evaluate clinical biological cellular specimens for the presence of disease. Detecting changes in cells that may lead to early, life-saving treatment, cytotechnologists are employed as practitioners in hospital and private laboratories, and as researchers, managers, and educators.

**Pre-Application Requirements**

1. 2 credits of English composition
2. 6 credits in the arts and/or humanities, excluding studio, skills, and techniques courses
3. 6 credits in the social and behavioral sciences
4. 12 credits of biology with lab
   (See Note 1)
5. 8 credits of chemistry with lab
6. 2 credits in college-level mathematics
7. 2.50 g.p.a.

Notes:

1. Students completing the courses at Stony Brook should take BIO 202 and 203 Fundamentals of Biology and HRM 320, 321 Microbiology and Laboratory, though other biological science courses may be substituted for HRM 320, 321.

2. Courses in geology, cell biology, anatomy, general microbiology, organic chemistry, computer literacy, sociology and human sexuality are recommended.

Dance (DAN)

The Dance minor is no longer being offered.

Digital Arts (DIA)

Digital technologies are reshaping all aspects of our culture; the arts and its related commercial and entertainment industries are no exception. The Digital Arts Minor enables students to explore digital production tools in print, web, video, animation, game, CD, DVD, performance, installation, interactive experience, information visualization, and public space. In addition to production skills, the Digital Arts Minor builds critical literacy in reading and understanding images, sound, and information as well as in interacting in mediated social networks. It encourages creative thinking and problem solving, often cited as necessary skills for the 21st century and the pace of change in technology. The minor provides the education and fosters skills now crucial to being a citizen, consumer, cultural producer, and innovator in today’s global visual and information culture.

This minor is particularly well suited for, but not limited to, students in Studio Art (ARS), Cinema and Cultural Studies (CCS), Computer Science (CSE), Multi-disciplinary Studies (MTD), Music (MUS), Theatre (THR), Journalism (JRN), and Business (BUS).

**Requirements for the Minor in Digital Arts (DIA)**

All letter-graded courses for the minor in Digital Arts must be passed with a letter grade of C or higher. Completion of the minor requires 21 credits.

To earn a Digital Arts Minor students must take one Core course (category A), one Foundations course (category B), and one Intermediate Production course (category C). Students must also take one additional production course chosen from categories C or D, one Theory and Culture course chosen from category E, and six
additional elective credits chosen from categories C, D, or E. Nine or more credits for the minor must be upper division.

A. Core Courses:
ARS/MUS/THR 208 Introduction to Digital Media Technology
ARS 225 Introductory Digital Art

B. Foundations in the Arts:
ARS 225 Foundations in Visual Arts: Idea and Form
CCS 101-D Images and Texts: Understanding Culture

C. Intermediate Production Courses:
ARS/MUS/THR 317 Interactive, Performance, Media, and MIDI
ARS/MUS/THR 318 Movies: Shoot, Score, and Edit
ARS 325 Intermediate Digital Art: Print
ARS 326 Intermediate Digital Arts: Video
ARS 327-H Intermediate Digital Arts: Web Art, Design, and Culture
ARS 328 Intermediate Digital Arts: Animation
ARS/MUS/THR 341 Sound Design
ARS 425 Advanced Digital Arts
MUS 340 Introduction to Music Technologies

D. Other Production Courses:
ARS 381 Photography 2
ARS 481: Photography 3
ARS 482: Photography 4
ARS 390-G/491/492 Topics (only approved topics)
ARS 487 Advanced Directed Projects in Studio
ARS/MUS/THR/CCS/CSE/ISE 488 Internship
CSE 102 Introduction to Web Design and Programming
ISE 108 Introduction to Programming
CSE 325 Computers and Sculpture
CSE 334 Introduction to Multimedia Systems (also ISE 334)
CSE 364 Advanced Multimedia (also ISE 364)
CSE 380 Computer Game Programming
CSE 381 Advanced Game Programming
MUS 437 Electronic Music

E. Theory and Culture Courses:
ARH 322-G American Art Since 1947
ARH 333-K Arts for the Public
ARH 334-G Performance Art
ARH 335-G History of Photography
ARH 336-G Digital Visual Culture
ARH 342-G Art of the 20th Century
ARH 400 Topics in Art History (only approved topics)
CCS 201 Writing About Culture
CCS 301-G Theorizing Cinema and Culture
CCS 313-H Television Studies
CCS 391-J Contemporary African Cinema and Cultural Studies
CCS 395-H Digital Cultural Studies
CCS 401 Senior Seminar in Cinema and Cultural Studies
CLT 335 Interdisciplinary Study of Film
CSE 301-H History of Computing
EST 310 Game Design
MUS 300-H Music, Technology, and Digital Culture
THR 277 The Media Industry
THR 403 Media: Theory and Criticism

Notes:
1. No more than six credits from any 488 internship may be applied to the minor.
2. No more than three credits from 487 may be applied to the minor.
3. Pre-approval for appropriate 487 projects and 488 internships is required.
4. ARS majors should be aware that many ARS courses require ARS 154 as a prerequisite, although ARS 154 is not required for DIA courses.

### Education and Teaching Certification

All students seeking a certification and resulting NYS license in the teaching of a specific science (Biology, Chemistry, Earth Science, or Physics) at the adolescent level (Grades 7 - 12) can, by the addition of eighteen (18) credits in two sciences combined other than the primary science for which they are licensed, add a General Science Extension to their primary license. See your teacher preparation program director or academic advisor for additional information.
Area of Specialization

Each area of specialization requires two design-related courses and three elective courses above those used toward Requirement A, Core. Other technical electives may be substituted only with the approval of the undergraduate program director.

Biomedical Engineering

Biomedical engineering is the application of various engineering disciplines to biomedical problems, requiring sound understanding of an engineering discipline coupled with principles of biology and medicine. Students utilize elective courses to learn the fundamentals of biology and bioengineering.

1. One of the following two-course design sequences must be completed.
   a. ESM 334 Materials Engineering
      ESM 335 Strength of Materials
   b. MEC 310 Introduction to Machine Design
      MEC 410 Design of Machine Elements
   c. MEC 305 Heat and Mass Transfer
      MEC 364 Introduction to Fluid Mechanics

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 305 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)
   EST 392 Engineering and Managerial Economics

Note: Three credits of research (ESM 499 or 488) may be used as a technical elective with permission of the undergraduate program director.

Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of the instructor and the undergraduate program director.

Civil and Environmental Engineering

Civil engineering involves study, research, and design of infrastructure or processes responding to societal needs for sustainable development. The student completes one of two specializations. Each provides preparation for further study or employment in structural materials engineering, environmental remediation, or engineering involving design for environment (DFE).

Civil Engineering Track:

1. Two required courses:
   a. ESM 334 Materials Engineering
   b. GEO/MAR 318 Engineering Geology and Coastal Processes or GEO 309 Structural Geology or MEC 364 Introduction to Fluid Mechanics

2. Three technical electives chosen from the following:
   CME 314 Chemical Engineering Thermodynamics I
   GEO 315 Groundwater Hydrology
   ISE 320 Information Management
   MEC 305 Heat and Mass Transfer
   MEC 363 Mechanics of Solids
   MEC 406 Energy Management in Commercial Buildings
   MEC 455 Applied Stress Analysis
   A third course from 1. above
   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
   EST 392 Engineering and Managerial Economics

Note: ESG 440/441 Engineering Science Design III, IV (See Note)

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 I)

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
   CME 314 Chemical Engineering Thermodynamics II
   ESG 320 Sensor Materials and Devices
   ISE 320 Information Management
   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
   EST 392 Engineering and Managerial Economics

Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS

the instructor and the undergraduate program director.

Electrical Engineering

This specialization is intended to provide a depth of understanding of electronic devices, electronic materials, and electrical and electronic system design built upon the broad engineering science curriculum.

1. One of the following two-course design sequences:
   a. ESE 218 Digital Systems Design and ESE 380 Embedded Microprocessor Systems Design I
   b. ESE 305 Deterministic Signals and Systems and ESE 315 Control Systems Design

2. ESE 372 Electronics

3. Two courses chosen from the following:
   ESE 304 Applications of Operational Amplifiers
   ESE 306 Random Signals and Systems
   ESE 307 Analog Filter Design
   ESE 310 Electrical Circuit Analysis II
   ESE 311 Analog Integrated Circuits
   ESE 316 Digital Devices and Circuits
   ESE 319 Introduction to Electromagnetic Fields and Waves
   ESE 332 Semiconductor Device Characterization
   ESE 350 Electrical Power Systems
   ESE 352 Electromechanical Energy Converters
   ESE 358 Computer Vision
   ESE 362 Optoelectronic Devices and Optical Imaging Techniques
   ESE 381 Embedded Microprocessor Systems Design II
   ESE 440/441 Engineering Science Design III/IV (See Note)
   EST 392 Engineering and Managerial Economics

Note: Three credits of research (ESM 499 or 488) may be used as a technical elective with permission of the instructor and the undergraduate program director.

Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of the instructor and the undergraduate program director.

Materials Science and Engineering

This specialization provides the opportunity for in-depth study of the relationship between performance-properties-processing in materials engineering and its applications.

1. One of the following two-course design sequences:
   a. ESM 334 Materials Engineering and ESM 335 Strength of Materials
   b. MEC 310 Introduction to Machine Design and MEC 410 Design of Machine Elements
   c. MEC 305 Heat and Mass Transfer and MEC 364 Introduction to Fluid Mechanics
   d. ESE 218 Digital Systems Design and ESE 380 Embedded Microprocessor Systems Design I
   e. ESE 305 Deterministic Signals and Systems and ESE 315 Control System Design

2. Three courses from the following:
   ESM 325 Diffraction Techniques and Structure of Solids
   ESM 335 Strength of Materials
   ESM 334 Materials Engineering
   ESM 336 Biomaterials: Manufacture, Properties, and Applications
   ESM 369 Polymers
   ESM 475 Engineering Science Design III/IV (See Note)
   ESE 392 Engineering and Managerial Economics

Note: Three credits of research (ESM 499 or 488) may be used as a technical elective with permission of the undergraduate program director.

Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of the instructor and the undergraduate program director.

Mechanical and Manufacturing Engineering

This specialization addresses the rapidly changing technology in the mechanical engineering and manufacturing industries that requires a highly educated workforce with knowledge of mechanical properties of materials, materials processing, design, thermodynamics, statistics, and analysis.

1. One of the following two-course design sequences:
   a. MEC 310 Introduction to Machine Design and MEC 410 Design of Machine Elements
   b. ESM 334 Materials Engineering and ESM 335 Strength of Materials

2. MEC 363 Mechanics of Solids

3. Two courses from the following:
   AMS 310 Survey of Probability and Statistics
   MEC 325 Manufacturing Processes
   MEC 364 Introduction to Fluid Mechanics
   MEC 381 Transport and Fate of Pollutants
   MEC 393 Engineering Fluid Mechanics
   MEC 398 Thermodynamics II
   MEC 402 Mechanical Vibrations
   MEC 411 Control System Analysis and Design
   MEC 420 Turbomachinery and Applications
   MEC 422 Thermal System Design
   MEC 455 Applied Stress Analysis
   ESG 440/441 Engineering Science Design III/IV (See Note)
   EST 392 Engineering and Managerial Economics

Note: Three credits of research (ESM 499 or 488) may be used as a technical elective with permission of the undergraduate program director.

Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of the instructor and the undergraduate program director.

Nanoscale Engineering

The creation of functional materials and devices which involves controllable processes and transformations at the scale of billionths of a meter promises to become a major focus of future efforts in both engineering and scientific research. With a thorough background in materials science, engineering design, and surface and molecular chemistry and devices, this specialization prepares students for graduate study, as well as professional positions in materials and
process engineering and research and development.

1. Two required courses:
   a. ESM 334 Materials Engineering
   b. ESG 320 Sensor Materials and Devices

2. Three technical electives chosen from:
   - ESM 369 Polymers
   - CHE 301 Physical Chemistry I
   - CHE 302 Physical Chemistry II
   - CHE 321 Organic Chemistry I
   - CHE 322 Organic Chemistry II
   - CHE 345 Structure and Reactivity in Organic Chemistry
   - BME 381 Nanofabrication in Biomedical Applications
   - ESM 488 Cooperative Industrial Practice (3 credits)
   - ESM 499 Research in Materials Science (3-4 credits)
   - Other departmental independent research with permission of the program director
   - ESG 440, 441 Engineering Science Design III, IV (see Note)
   - EST 392 Engineering and Managerial Economics

Note: ESG 440/441 Engineering Science Design III/IV counts for one technical elective with permission of the instructor and the undergraduate program director.

Environmental Engineering (ENE)

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

A. Two required courses:
   - ESM 212: Introduction to Environmental Materials Engineering
   - or BME 305 Biofluids*
   - or CHE 318 Fluid Mechanics*
   - or MEC 364 Fluid Mechanics*
   - One course selected from CHE 312: Physical Chemistry, short course or CHE 301: Physical Chemistry I

*May be taken as a technical elective if not taken as a required course.

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 the 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

Humanities (HUM)

Requirements for the Major in Humanities (HUM)

D. Advanced Studies by Epoch

Twenty-one upper-division credits (seven courses numbered 300 or higher) in courses with the listed designators, to be distributed as follows:

three courses in two of the following epochs

two courses chosen from a third epoch

Information Systems (ISE)

Sample Course Sequence for the Major in Information Systems

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<th>Freshman Fall</th>
<th>Credits</th>
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<tr>
<td>ISE 102</td>
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<td>ISE 108</td>
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<tr>
<td>Specialization Course</td>
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</tr>
<tr>
<td>WRT 101 (D.E.C. A)</td>
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<table>
<thead>
<tr>
<th>Spring Credits</th>
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<tbody>
<tr>
<td>First Year Seminar 102</td>
</tr>
<tr>
<td>ISE 108</td>
</tr>
<tr>
<td>Specialization Course</td>
</tr>
<tr>
<td>WRT 102 (D.E.C. A)</td>
</tr>
<tr>
<td>D.E.C.</td>
</tr>
<tr>
<td>Total</td>
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<td>ISE 208</td>
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<td>CSE 219</td>
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<td>D.E.C.</td>
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<td>ISE Elective</td>
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</table>
### 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 Courses
1. ISE 102 Introduction to Web Design and Programming
2. ISE 108 Introduction to Programming
3. ISE 208 Intermediate Programming
4. ISE 302 Professional Ethics for Computer Science
5. ISE 305 Database Design and Practice
6. ISE/CSE 308 Software Engineering
7. ISE 311 Systems Administration
8. ISE 320 Information Management
9. Three additional upper-division ISE courses, excluding ISE 475.

#### B. Mathematics Courses
1. AMS 151 Applied Calculus I (or MAT 131 or MAT 141 or MAT 125, 126)
2. AMS 201 Matrix Methods and Models (or AMS 210 Applied Linear Algebra or MAT 211 Introduction to Linear Algebra)
3. AMS 310 Survey of Probability and Statistics (or ECO 320 Mathematical Statistics)

#### C. Specializations

Students must complete a specialization in one of the application areas listed below, or else design a specialization of six to eight courses in another application area in consultation with the ISE Undergraduate Director before the courses for the specialization are completed.

#### D. Upper-Division Writing Requirement:

ISE 300 Writing in Information Systems

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

### Acceptance into the Information Systems Major

Qualified freshman and transfer applicants may be accepted directly into the Information Systems major upon admission to the University. Currently enrolled students may apply for acceptance to the major after completing the following two courses with grades of C or higher and a grade point average of 2.80 or higher.

1. ISE 102 Introduction to Web Design and Programming
2. ISE 108 Introduction to Programming

### Enrolling in ISE Courses

To enroll in ISE courses, students must have completed all prerequisites with a grade of C or higher (Pass/No Credit grades are not acceptable to meet prerequisites). For transfer students, official transfer credit evaluations must have been completed and approved.

Failure to satisfy the prerequisites or to attend the first class may result in deregistration. The Pass/No Credit option is not available to ISE majors for ISE courses.

### Specialization in Business and Economics

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

1. Core Courses
   a. BUS 111 Introduction to Business for Non-Business Majors
   b. ECO 108 Introduction to Economics
   c. BUS 210 Financial Accounting
2. One of the following:
   - BUS 214 Managerial Accounting
   - BUS 346 Operations Management
   - BUS 349 Management Science
   - BUS 355 Investment Analysis
   - BUS 356 Financial Engineering
   - ECO 348 Analysis for Managerial Decision Making
   - ECO 368 Modern Portfolio Theory
   - ECO 389 Corporate Finance
   - EST 392 Engineering and Managerial Economics
   - EST 393 Production and Operations Analysis
3. One of 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 350 Public Policy Analysis
   - POL 364 Organizational Decision Making
   - SOC 381 Sociology of Organizations

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### Table: Spring 2009: updates since Spring 2007 are in red
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:
   a. PSY 220 Survey in Developmental Psychology
   b. PSY 230 Survey in Clinical Psychology
   c. PSY 240 Survey in Social Psychology
   d. PSY 250 Survey in Biopsychology
   e. 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 Technological Systems Management

Students may take a specialization in Technological Systems Management consisting of the following courses:

1. Four required courses:
   a. EST 202 Introduction to Science, Technology, and Society Studies
   b. EST 391 Technology Assessment
   c. EST 392 Engineering and Managerial Economics
   d. EST 393 Project Management
2. Two elective courses from the following:
   a. EST 310/ISE 340 Design of Computer Games
   b. EST 320 Communication Technology Systems
   c. EST/ISE 323 Human-Computer Interaction
   d. EST 326 Management for Engineers
   e. EST 327 Marketing for Engineers
   f. EST 421 Starting the High-Technology Venture

Note: Courses cross-listed between ISE and EST may be taken either as ISE electives (Item A.3) or as TSM specialization electives (Item C).

Requirements for the Minor in Information Systems (ISE)

The minor in Information Systems is open to all students not majoring in either Computer Science or Information Systems or minoring in Computer Science. To declare the minor in Information Systems, students must complete ISE 102 with a grade of C or higher. The minor requires seven courses totaling 21 credits as outlined below:

1. ISE 102 Professional Ethics for Computer Science
2. ISE 108 Introduction to Programming
3. ISE 208 Intermediate Programming
4. Four electives totaling at least twelve credits. Electives must include nine credits of upper-division courses and at least nine credits of ISE courses. Approved electives include most ISE courses, as well as other courses relevant to Information Systems; for details contact the Department of Computer Science Undergraduate Office.

Courses in Latin American and Caribbean Studies (LAC)

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

LAC 200-J Introduction to Latin American and Caribbean Societies
LAC 380 Topics in Latin American Studies
LAC 487 Independent Research in Latin American and Caribbean Studies
LAC 488 Internship
LAC 490 Senior Seminar in Latin American and Caribbean Studies

Requirements for the Minor in Latin American and Caribbean Studies (LAC)

All courses offered for the minor must be passed with a letter grade of C or higher.

Completion of the minor requires 24 credits.

1. LAC 200-J Introduction to Latin American and Caribbean Societies
2. SPN 211 Intermediate Spanish I (Latin America) or SPN 210 Intermediate Spanish (Spain)
3. One literature or culture course, to be chosen from those listed in Group A
4. One additional upper-division course to be chosen from those listed in Group B
5. LAC 488 Internship (or LAC 487 Research with permission of director)
6. One 400-level seminar or three-credit upper-division independent study course in any department, approved by the director

Mechanical Engineering (MEC)

Sample Course Sequence for the Major in Mechanical Engineering

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<tr>
<th>Freshman Fall</th>
<th>Credits</th>
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<tbody>
<tr>
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<tr>
<td>MEC 101</td>
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<tr>
<td>PHY 131/133</td>
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</tr>
<tr>
<td>WRT 101</td>
<td>3</td>
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</table>

Latin American and Caribbean Studies (LAC)

The minor in Latin American and Caribbean Studies allows students to pursue an interdisciplinary course of study that provides a broad overview of Latin America and the Caribbean. Students are introduced to the principal historical, social, and cultural themes in the region, and through their electives, they are also able to develop more detailed knowledge of specific subjects in the region, such as the history of a particular country or the literature of a particular period.
SUPPLEMENT: MAJORS, MINORS, AND PROGRAMS

Note: MEC 125, 202, 203, 260, and 262 are offered during both fall and spring; all other courses are offered in their respective semesters. MEC 262 and 363 are also generally offered in the summer.

Nanotechnology Studies (NTS)

The minor in Nanotechnology Studies (NTS) is an interdisciplinary, research-intensive program intended for students in majors from the College of Engineering and Applied Sciences or the College of Arts and Sciences who wish to learn about the emerging field of nanotechnology. The coursework in the minor will provide a broad background in the science, design, manufacture, and societal, health and environmental impacts of nanomaterials and nanoscale structures and their applications in engineering and health related areas. The inclusion of a minimum of two semesters of research in the students’ own major areas, as well as choice of technical electives, will allow for integration into current interests and disciplines, and will provide knowledge and skills valuable to students planning to seek employment or graduate studies in fields related to the engineering, business, policy or the broader impact of nanotechnology.

Admittance to the minor requires the approval of the NTS faculty committee, following review of student performance in the 213 class and other relevant coursework.

Requirements for the Minor in Nanotechnology Studies (NTS)

All courses for the minor must be passed with an average grade of B or higher.

Completion of the minor requires 18-22 credits and consists of the following requirements:

1. BME 213 or ESM 213 or EST 213 or MEC 213
2. Two semesters (at least 6 credits) of independent research (499 or 488), co-advised by a faculty member from the student's major program and a second faculty advisor from the NTS faculty committee. Research topics must be approved by both faculty advisors for courses to be accepted to the NTS minor.
3. Two technical electives, chosen from among the following courses:
   a. BME 381 Nanofabrication in Biomedical Applications
   b. ESG 339 Thin Film Processing of Advanced Materials
   c. ESG 320 Sensor Materials and Devices
   d. MEC 470 Introduction to Tribology
   e. EST 391 Technology Assessment
   f. Another upper division technical course with permission of the NTS faculty committee

4. BME 400 or ESM 400 or EST 400 or MEC 400

Political Science (POL)

Programs of Study

Comparative Politics and International Relations

POL 211, 216, 302, 305, 307, 309, 310, 311, 313, 336, 337, 345, 350, 357, 372, 382, 405, 411, 412, 413. Also 287, 401, 402, 403, 404, 447, 487, and 495 when the topic is applicable.

American Government, Law, and Public Policy


Political Behavior and Political Psychology


South Asian Studies (SOA)

Requirements for the Minor in South Asian Studies (SOA)

All courses offered for the minor must be passed with a letter grade of C or higher. At least nine credits toward the minor must be upper-division.

Completion of the minor requires seven courses or 21 credits.

1. AAS 201 Introduction to the Civilization of the Indian Subcontinent

http://www.stonybrook.edu/ugbulletin
2. AAS/HIS 348 History of British India

3. One of the following:
   - AAS/RLS 256 Hinduism
   - AAS/RLS 260 Buddhism
   - AAS/RLS 280 Islam

4. Three of the following:
   - AAS 110 Appreciating Indian Music
   - AAS 212 Asian and Asian American Studies Topics in the Humanities (appropriate topic only)
   - AAS/LIN 250 Languages and Cultures of Asian Americans
   - AAS 320 Literature of India
   - AAS 330 Language and Society in South Asia
   - AAS 326 Indian Mythology
   - AAS 327 Great Epics of India: Ramayana and Mahabharata

5. One additional course (a minimum of 3 credits) chosen from the following:
   - AAS 211 Asian and Asian American Studies Topics in the Social Sciences (appropriate topic only)
   - AAS 212 Asian and Asian American Studies Topics in the Humanities (appropriate topic only)
   - ANT 311 Immersion in Another Culture (appropriate topic only)
   - ARH 203 History of Asian Art
   - CLIT 220 Non-Western Literature (appropriate topic only)
   - EGL 373 Literature in English from Non-Western Cultures (appropriate topic only)
   - EGL 374 Literature in Relation to Other Disciplines (appropriate topic only)
   - HIN 111 Elementary Hindi I
   - HIN 112 Elementary Hindi II
   - HIN 211 Intermediate Hindi I
   - HIN 212 Intermediate Hindi II
   - LIN 431 Analysis of an Uncommonly Taught Language (appropriate topic only)
   - AAS/RLS 367 Meditation and Enlightenment
   - AAS/RLS 380 Islamic Classics
   - AAS 391, 392 Special Topics in Asian and American Studies (formerly SAS 401, 402)
   - AAS 447 Directed Readings (formerly SAS 447)
   - AAS 487 Supervised Research (formerly SAS 487)
   - SKT 111 Elementary Sanskrit I
   - SKT 112 Elementary Sanskrit II
   - SKT 211 Intermediate Sanskrit I
   - SKT 212 Intermediate Sanskrit II
   - THR 313 Asian Theatre and Drama

Technical Leadership (LTL)

The minor consists of:

1. LSE 201 Opportunities in Science and Engineering (1 credit)
2. EST 304 Communications for Engineers and Scientists (or ESE 300 for Electrical and Computer Engineering majors only)
3. BUS 111 Introduction to Business for Non-Business Majors or BUS 115 Introduction to Business for Business Majors
4. Any introductory 3 credit computer programming course including CSE 102
5. Any 300-level 3 credit EST course or ARS 208

Technological Systems Management (TSM)

Sample Course Sequence for the Major in Technological Systems Management

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<th>Freshman Fall</th>
<th>Credits</th>
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<td>Total</td>
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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.

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
Another EST course with permission of the Undergraduate Program Director

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
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 that 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 Math-ematics 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
      - PHY 301 Electromagnetic Theory
      - PHY 303 Mechanics
      - PHY 335 Electronics and 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 222 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
   - CHE 370 Cellular Biology for Chemical Engineers
   - CHE 371 Biomedical Polymers
   - CHE 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 335 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>
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<th>Sophomore Fall</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AMS 261</td>
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</tbody>
</table>

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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
   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
      CHI 111/210/211 or AAS 250 Language & Culture of Asian Americans
   Year 1 Spring:
      AAS 370 Intercultural Communication
   Year 2 Fall:
      CHI 311/321
      AAS 350 Structure of Mandarin Chinese
   Year 2 Spring:
      AAS 404 China Studies Seminar

Culture and Civilization Track
   Year 1 Fall:
      HIS 219 Intro Chinese History & Civilization
      AAS 300 Intellectual History of East Asia or AAS/RLS 256/260/280
   Year 1 Spring:
      AAS 372 Family Marriage and Kinship in China
   Year 2 Fall:
      AAS 318 Arts of China
      AAS 371 Ancient China
   Year 2 Spring:
      AAS 404 China Studies Seminar

Science and Contemporary China Track
   Year 1 Fall:
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

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:
   - CSE 327 Fundamentals of Computer Vision
   - CSE 328 Fundamentals of Computer Graphics
   - CSE 332 Introduction to Scientific Visualization
   - CSE 333 User Interface Development
   - CSE 334 Introduction to Multimedia Systems
   - CSE 336 Internet Programming
   - CSE 352 Artificial Intelligence
   - CSE 364 Advanced Multimedia Techniques
   - CSE 366 Introduction to Virtual Reality

CSE 378 Introduction to Robotics
CSE 390-394 Special Topics in Computer Science*
PSY 366 Human Problem Solving
PSY 368 Sensation and Perception
PSY 369 Special Topics in Cognition and Perception
PSY 384 Research Lab: Human Factors
*Special topic must be in human-computer interaction.

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:
   - CSE 306 Operating Systems
   - CSE 320 Computer Architecture
   - CSE 334 Introduction to Multimedia Systems
   - CSE 352 Artificial Intelligence
   - CSE 364 Advanced Multimedia Techniques
   - CSE 370 Wireless and Mobile Networking
   - 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

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<th>Freshman Fall</th>
<th>Credits</th>
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<tr>
<td>D.E.C.</td>
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<thead>
<tr>
<th>Junior Fall</th>
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<tbody>
<tr>
<td>CSE 300</td>
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<td>CSE Software course</td>
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<td>CSE 303</td>
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<td>AMS 310</td>
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<td>D.E.C.</td>
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<tr>
<td>Elective</td>
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<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSE 302</td>
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<tr>
<td>CSE Software course</td>
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</tr>
<tr>
<td>CSE 373</td>
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<tr>
<td>CSE Elective</td>
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<td>D.E.C.</td>
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<tr>
<td>Elective</td>
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<tr>
<th>Senior Fall</th>
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<tr>
<td>CSE 308</td>
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<tr>
<td>CSE Hardware Course</td>
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<td>D.E.C.</td>
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<td>D.E.C.</td>
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<tr>
<td>Elective</td>
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<table>
<thead>
<tr>
<th>Spring</th>
<th>Credits</th>
</tr>
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</table>
1. Two required courses:
   a. MEC 111 or MEC 112 or CSE 114 or CSE 130 or ESE 124 may be substituted with permission of the department.

2. Three courses from the following:
   a. MEC 310 Introduction to Machine Design
   b. MEC 364 Introduction to Fluid Mechanics
   c. ESM 335 Introduction to Environmental Materials Engineering
   d. ESM 488 Cooperative Industrial Laboratory
   e. ESM 499 Research in Materials Engineering

3. Three technical electives chosen from:
   a. MEC 310 Introduction to Machine Design
   b. MEC 364 Introduction to Fluid Mechanics
   c. ESM 335 Introduction to Environmental Materials Engineering

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; ESE 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:
   a. BUS 210 Financial Accounting
   b. BUS 330 Principles of Finance
   c. BUS 340 Information Systems in Business, Technology and Society
   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.

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 364 Introduction to Fluid Mechanics and ESM 335 Introduction to Environmental Materials Engineering
   c. ESM 335 Introduction to Environmental Materials Engineering and ESM 335 Strength of Materials

Electrical Engineering
3. Two courses chosen from the following:
   a. ESE 355 Deterministic Signals and Systems
   b. ESE 315 Control Systems Design

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>
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<tbody>
<tr>
<td>AMS 261</td>
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<tr>
<td>ESE 271</td>
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<tr>
<td>MEC 260</td>
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<tr>
<td>ESG 217#</td>
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<td>ESG 302</td>
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<tr>
<td>Spring</td>
<td>Credits</td>
</tr>
<tr>
<td>AMS 261</td>
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</tr>
<tr>
<td>ESE 271</td>
<td>4</td>
</tr>
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<td>ESG 316</td>
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<tr>
<td>MEC 262</td>
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<td><strong>Total</strong></td>
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</tr>
<tr>
<td>Junior Fall</td>
<td>Credits</td>
</tr>
<tr>
<td>ESG 312# and 300</td>
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<tr>
<td>D.E.C.</td>
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<tr>
<td>ESG 332</td>
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<td>ESG 333</td>
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<tr>
<td>Senior Fall</td>
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<tr>
<td>ESG 440#</td>
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<td>ESM 450</td>
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<td>Technical elective (design)#</td>
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<td>ESG 375</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
2. CSE 212 Foundations of Computer Science II
3. CSE 214 Computer Science II
4. CSE 215 Foundations of Computer Science
5. CSE 219 Computer Science III
6. CSE 220 Computer Organization and Systems Programming
7. CSE 110 Introduction to Computer Science
8. ISE/CSE 305 Principles of Database Systems
9. ISE/CSE 308 Software Engineering
10. ISE/CSE 310 Data Communication
11. 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.

C. Economics and Business Courses

1. BUS 111 Introduction to Business for Non-Business Majors
2. ECO 108 Introduction to Economics
3. BUS 210 Financial Accounting
4. One course chosen from the following:
   - BUS 214 Managerial Accounting
   - BUS 346 Operations Management
   - BUS 349 Management Science
   - BUS 355 Investment Analysis
   - BUS 356 Financial Engineering
   - ECO 348 Analysis for Managerial Decision Making
   - ECO 368 Modern Portfolio Theory
   - ECO 389 Corporate Finance
   - EST 392 Engineering and Managerial Economics
   - EST 393 Production and Operations Analysis
5. 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 Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>First Year Seminar 101</td>
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<td>CSE 110</td>
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<td>AMS 151</td>
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<td>BUS 111</td>
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<tr>
<td>WRT 101</td>
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<table>
<thead>
<tr>
<th>Sophomore Fall</th>
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<tbody>
<tr>
<td>CSE 213</td>
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<td>CSE 214</td>
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</tr>
<tr>
<td>CSE 215</td>
<td>3</td>
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<tr>
<td>AMS 201</td>
<td>3</td>
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<tr>
<td>ECO 108 (D.E.C.F)</td>
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<td>D.E.C.</td>
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</tr>
<tr>
<td>Total</td>
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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.