



2024-2025 Course Catalog

STATE UNIVERSITY OF NEW YORK
College of Environmental Science and Forestry

TABLE OF CONTENTS

About ESF.....	4
Academic Calendar.....	10
Admission Policies & Requirements.....	34
Student Financial Information.....	47
Degree Programs and Areas of Study	73
General Education.....	77
Minors.....	83
Special Academic Options.....	112
Graduate Study: Degrees and Options.....	115
Department of Chemical Engineering.....	119
Bachelor of Science in Bioprocess Engineering.....	119
Bachelor of Science in Chemical Engineering.....	123
Bachelor of Science in Paper Engineering.....	127
Bachelor of Science in Renewable Materials Science.....	130
Wood Science Option.....	133
Polymer Science Option.....	136
Graduate Program in Chemical Engineering.....	139
Department of Chemistry.....	142
Bachelor of Science in Biochemistry.....	143
Bachelor of Science in Chemistry.....	148
Graduate Programs Chemistry.....	151
Department of Environmental Biology.....	156
Bachelor of Science in Aquatic and Fisheries Science.....	158
Bachelor of Science in Biotechnology.....	162
Bachelor of Science in Conservation Biology.....	167
Bachelor of Science in Environmental Biology.....	171
Bachelor of Science in Forest Health.....	174
Bachelor of Science in Wildlife Science.....	178
Graduate Programs in the Department of Environmental and Forest Biology.....	182
Department of Environmental Resources Engineering.....	187
Bachelor of Science in Environmental Resources Engineering.....	188
Graduate Program in Environmental Resources Engineering.....	194
Division of Environmental Science.....	198
Bachelor of Science in Environmental Science.....	199
Bachelor of Science in Environmental Health.....	207
Graduate Program in Environmental Science (GPES).....	214
Department of Environmental Studies.....	220
Bachelor of Science in Environmental Education and Interpretation.....	221
Bachelor of Science in Environmental Studies.....	225
Graduate Programs.....	229
Department of Landscape Architecture.....	238
Bachelor of Landscape Architecture.....	239
B.L.A./M.S. Fast Track.....	242
Master of Landscape Architecture (M.L.A.).....	244
ESF Open Academy.....	247
Bachelor of Science in Sustainability Management.....	248
Department of Sustainable Resources Management.....	251
Bachelor of Science in Construction Management.....	252
Bachelor of Science in Forest Ecosystem Science.....	255
Bachelor of Science in Forest Resources Management.....	258

Bachelor of Science in Natural Resources Management.....	261
Bachelor of Science in Sustainable Energy Management.....	264
Graduate Programs Sustainable Resources Management.....	267
Certificate in Climate & Sustainability Leadership.....	277
The Ranger School.....	278
Environmental and Natural Resources Conservation (A.A.S.).....	279
Forest Technology (A.A.S.).....	281
Land Surveying Technology (A.A.S.).....	283
A-Z Course List.....	285
ESF Faculty and Professional Staff.....	285
Emeriti Faculty.....	301

ABOUT ESF

ESF has 26 undergraduate majors, 22 leading to the Bachelor of Science degree, one leading to the Bachelor of Landscape Architecture degree, and three leading to the Associate of Applied Science degree. Our programs cover chemical engineering, paper engineering, bioprocessing engineering, environmental sciences, environmental health, sustainable resources management, environmental resources engineering, environmental biology, environmental design, environmental policy, environmental social science, and the utilization of natural resources.

ESF's programs are administered through eight academic departments and the interdisciplinary Division of Environmental Science. The A.A.S. programs are conducted at ESF's Wanakena Campus in the Adirondacks under the auspices of the Department of Sustainable Resources Management (SRM).

ESF's Graduate School oversees nine graduate programs, each with multiple options, and all focusing on science, engineering, or management.

ESF's academic programs rely heavily on experiential learning, including indoor and field laboratories, internships, research experiences, and applied capstone projects. In the most recent National Survey of Student Engagement (2020), ESF graduating seniors reported having significantly more research experiences, culminating senior experiences, and service-learning experiences, than peer comparison groups.

The overall student/faculty ratio is 14:1; the undergraduate ratio is 12:1.

For the class entering 2019, the six-year graduation rate calculated in 2025 was 71.3%. The SUNY average for the year 2017 is 66%. This compares to a national Public average of 63.5%, according to SUNY fast facts website. In a survey of 2024 baccalaureate graduates (80.1% response rate), 97% reported employment or graduate school placement within 6 months of graduation; 90% of respondents reported working in a position related to their majors.

ESF Campuses

- www.esf.edu/about/campus

ESF is a multiple-campus institution that includes approximately 1 million square feet of facilities in 186 buildings on 25,000 acres of land. Facilities for education and research are provided on the main campus in Syracuse and at five regional campuses and three field stations.

About the State University of New York (SUNY)

- www.suny.edu

The State University of New York's 64 geographically dispersed campuses bring educational opportunity within commuting distance of virtually all New Yorkers and comprise the nation's largest comprehensive system of public higher education.

Accreditation

**The State University of New York College of Environmental Science and Forestry is accredited by:
Middle States Commission on Higher Education**

1007 North Orange St.
4th Floor, MB #166
Wilmington, DE 19801

The Middle States Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation.

The master of forestry degree; the bachelor of science degrees in forest resource management, forest ecosystem science and natural resources management; and the associate in applied science degree in forest technology are accredited by the Society of American Foresters (SAF). SAF is recognized by the Commission on Recognition of Postsecondary Accreditation as the specialized accrediting body for forestry in the United States:
Society of American Foresters
5400 Grosvenor Lane
Bethesda, MD 20814-2198
301-897-8720

The bachelor of science degrees in bioprocess engineering, environmental resources engineering, and paper engineering are accredited by:
Engineering Accreditation Commission of ABET
111 Market Place, Suite 1050
Baltimore, MD 21202
410-347-7700

The associate in applied science degree in land surveying technology is accredited by:
Engineering Technology Accreditation Commission of ABET
111 Market Place, Suite 1050
Baltimore, MD 21202
410-347-7700

The bachelor of landscape architecture and master of landscape architecture degrees are accredited by:
Landscape Architectural Accreditation Board
603 Eye St. NW, Suite 500
Washington, D.C. 20001

Admission

Undergraduate Admission

Undergraduate enrollment for Fall 2025 was 1843. Approximately 30% of our undergraduate students are transfers from other colleges and universities and 1% are international students; of Fall 2025 first-year students, 78% residents are of New York state.

Admission at the undergraduate level is selective with holistic application review based on academic rigor and performance at prior institutions.

- www.esf.edu/admissions/undergraduate

High School Students

High School seniors may apply for admission under one of the three pathways available:

- **Early Action First-Year**
- **Regular First-Year**
- **Guaranteed Transfer** (future entry as a sophomore or junior)

The level of the applicant's interest in ESF and the quality of their academic performance in high school will determine which pathway is most appropriate. Admissions staff members can assist applicants in selecting their admission pathway. Students who have completed college level coursework prior to high school graduation will be considered as first year applicants.

Transfer Students

- [esf.edu/admissions/undergraduate/transfer/](https://www.esf.edu/admissions/undergraduate/transfer/)

SUNY ESF welcomes transfer students in all undergraduate programs of study. Approximately 30% of our students transfer to ESF. Applicants who have completed college-level coursework following high school graduation will be considered as transfer applicants.

Graduate School Admission

- www.esf.edu/graduate

ESF is a Carnegie Doctoral/Research university. Other Carnegie descriptors include STEM dominant, high undergraduate, more selective, primarily residential, and higher transfer-in. ESF is the only Carnegie Doctoral/Research university that is classified as "small."

Graduate enrollment for Fall 2025 was 364 students. 44% are enrolled in doctoral programs; 40% M.S., 15% in professional master's, and the remainder are in certificates of advanced studies or are visiting students. 30% of graduate students are international.

Admission to the Graduate School is conditional upon review and acceptance of an applicant's credentials by appropriate faculty members and upon the recommendation of the appropriate department chairman or program director to the Interim Associate Provost for Academic Affairs and Dean of the Graduate School.

Faculty

- www.esf.edu/faculty

International Education

- www.esf.edu/international

The Office of International Education (OIE) services include immigration advising for F-1 and J-1 students and J-1 visiting scholars, and immigration document processing for Admissions and the Graduate School. The office also offers study abroad advisement for all students wanting to have an international experience, and the office supports international education programming and orientation for newly arrived international students and scholars. OIE serves as an emergency point of contact for students conducting research abroad, participating in international programs, and ESF faculty-led courses abroad.

Research

- www.esf.edu/research

Research at ESF is remarkably diverse, current, and challenging, with contributions being made in fields like aquatic ecosystems, bioenergy, biotechnology, biodiversity, ecology, genetic engineering, nanotechnology, remote sensing, wildlife disease prevention, and many others.

ESF is a leader in integrating the energy and excitement of research with the formal requirements of degree and certificate programs. A high percentage of undergraduates and virtually all graduate students participate in research activity as part of their educational experience.

Staff and Administration

- www.esf.edu/about/leadership/president
- www.esf.edu/about/leadership/executive-vp-and-provost
- www.esf.edu/about/leadership/board-of-trustees

Student Affairs

- www.esf.edu/student-affairs

The Division of Student Affairs is guided by the College's strategic goal of providing an outstanding student experience. The creative and dedicated team of professionals in Student Affairs will work to achieve this goal by creating opportunities for personal and leadership development, through community-focused learning experiences, and by offering services to promote academic and career success.

Key Policies and Procedures

- www.esf.edu/employees/policies

Campus Safety Report

- www.esf.edu/safety/annual-security-reports.php

A Campus Safety Report is filed as required by the federal "Crime Awareness and Campus Security Act," or "Clery Act." The purpose of this report is to provide our faculty, staff and students with campus safety information including crime statistics and procedures to follow to report a crime.

The report is prepared and published each Oct. 1 by our University Police, Judicial Affairs and Environmental Health and Safety Department. It is also available in printed format from the University Police Department in Room 19 Bray Hall on request.

Collegewide Smoking Policy

- www.esf.edu/employees/policies/policies-tobacco-free.php

New York State legislation regulates smoking in all workplaces. Effective July 24, 2003, smoking is prohibited in all indoor areas on College property. Individuals who choose to smoke may do so outdoors, no closer than 20 feet from building openings such as doors, windows, air intakes, loading docks or similar structures, or in any area where flammable substances or combustible materials are used or stored. Smoking also is prohibited in all College vehicles.

Student Consumer Information

- www.esf.edu/consumer

This website provides student consumer information as required by the Federal Higher Education Opportunity Act and the United States Department of Education.

Title IX

- www.esf.edu/administration/titleix

Title IX is the federal anti-discrimination law that states: "No person in the U.S. shall, on the basis of sex, be excluded from participation in, or denied the benefits of, or be subjected to discrimination under any educational program or activity receiving federal aid." (Title IX of the Education Amendments of 1972).

This applies to all College programs and activities including, but not limited to, academic and athletic programs, financial aid and student records and accounts, health and counseling services, and housing and residence life programs.

Title IX prohibits sex discrimination against students, employees, or third parties. Sex discrimination includes sexual harassment, sexual assault, and sexual violence.

VA Pending Payment Compliance

In accordance with Title 38 US Code 3679 subsection (e), this school adopts the following additional provisions for any students using U.S. Department of Veterans Affairs (VA) Post 9/11 G.I. Bill® (Ch. 33) or Vocational Rehabilitation and Employment (Ch. 31) benefits, while payment to the institution is pending from the VA. This school **will not**:

- Prevent nor delay the student's enrollment
- Assess a late penalty fee to the student
- Require the student to secure alternative or additional funding
- Deny the student access to any resources available to other students who have satisfied their tuition and fee bills to the institution, including but not limited to access to classes, libraries, or other institutional facilities

However, to qualify for this provision, such students may be required to:

- Produce the Certificate of Eligibility by the first day of class
- Provide written request to be certified
- Provide additional information needed to properly certify the enrollment as described in other institutional policies

Out-of-State Distance Education Complaints

New York State is a member of the [State Authorization Reciprocity Agreement \(SARA\)](#) and ESF has been a participating institution since 2017. SARA participation enables ESF to offer its online courses and programs to students residing in other SARA member states- currently AL, AK, AZ, AR, CO, CT, DE, DC, FL, GA, GU, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, MT, NE, NV, NH, NJ, NM, NC, ND, OH, OK, OR, PA, PR, RI, SC, SD, TN, TX, UT, VT, VA, VI, WA, WV, WI, WY. ESF follows policies and procedures outlined within the [SARA Policy Manual](#), which includes addressing [student complaints related to distance education and SARA policies](#). Consumer complaints related to distance education courses, activities, operations, or other SARA provisions

may be submitted to the Associate Provost of Instruction and Dean of the Graduate School at GradDean@esf.edu for investigation and resolution. In the event campus grievance procedures have been followed and all avenues of appeals exhausted and documented, and the issue remains unresolved, distance education students residing in a SARA member state may file a [SARA complaint to the System Administration of the State University of New York](#). And, if still not satisfied, a SARA complaint may then be submitted to the New York State Education Department, New York's SARA Portal Entity, within two years of the incident about which the complaint is made. [New York State Education Department's complaint process](#). Please note, this does not include complaints related to grades or student conduct violations, both of which are to be fully addressed via campus processes, not through the SARA complaint resolution procedures.

California is currently not a SARA member. As an out-of-state public institution without a physical presence in the state, ESF can still enroll CA students in online courses and programs. In the event campus grievance procedures have been followed and all avenues of appeals exhausted and documented, and the issue remains unresolved, online students in California may file a complaint with the [California Department of Consumer Affairs](#).

In-Person/In-State Education Complaints

New York State in-person/in-state students would be able to appeal a complaint decision to NYSED through the [general complaint information webpage](#).

ACADEMIC CALENDAR

Fall 2025

Syracuse Campus

Classes begin	August 25
Financial Drop Deadline - Last day to drop for 100% tuition refund Bursar's Office liability schedule	August 31
Labor Day (no classes)	September 1
Last day to add a class	September 2
Academic Drop Deadline - Last day to drop a class	September 19
Grad: Deadline for Candidacy or Exam Chair Request	September 19
Fall break (no classes)	October 13 - 14
Mid-term grading	October 13 - 17
Advising for Spring 2026	October 27 - November 4
Registration for Spring 2026	November 5 - January 2
Thanksgiving Recess (no classes)	November 23 - 30
Last day to withdraw from a class	December 3
Last day of classes	December 9
Reading day	December 10
Final Exams	December 11 - 12
Reading days	December 13 - 14
Final Exams	December 15 - 16
Grad MS/PhD: Final Thesis/Dissertation & other final documents due to graduate school	December 16
Grad MPS/MLA/MF: Present Capstone & submit final documents	December 16
Grades due	December 23

Wanakena Campus

Ranger School Arrival/Move-in	August 17
Ranger School classes begin	August 20
Labor Day (no classes)	September 1
Fall break (no classes)	October 13
Thanksgiving Recess	November 23-November 30
Last day of classes Ranger School	December 19
Grades due Ranger School	December 26

Spring 2026**Syracuse Campus**

Classes begin	January 12
Martin Luther King Day (no classes)	January 19
Last day to add a class	January 20
Academic Drop Deadline - Last day to drop a class	February 6
Grad: Deadline for Candidacy or Exam Chair Request	February 6
Mid-term Grading	March 2 - 6
Spring break (no classes)	March 8 - 15
Advising for Fall 2026	April 1 - April 7
Registration for Fall 2026	April 8 - June 30
Last day to withdraw from a class	April 17
Last day of classes	April 27
Reading days	April 28 - 29
Final Exams	April 30 - May 1
Reading days	May 2 - 3
Final Exams	May 4 - 5
Grad MS/PhD - Final Thesis/Dissertation & other final documents due to graduate school	May 5

Grad MPS/MLA/MF - Present Capstone & submit final documents	May 5
ESF May Commencement	May 9
ESF/SU Joint May Commencement	May 10
Grades due	May 12

Wanakena Campus

Ranger School Arrival/Move-in	January 11
Ranger School classes begin	January 12
Martin Luther King Day (no classes)	January 19
Ranger School Spring Recess (no classes)	March 14-22
Last day of classes Ranger School	May 15
Ranger School Commencement	May 16
Grades due Ranger School	May 20

Summer 2026

Registrar's Office to begin accepting registration forms	February 1
Maymester (2 weeks)	May 11 - 22
Memorial Day (no classes, campus closed)	May 25
Summer Session 1 (6 weeks)	May 18 - June 26
Juneteenth (no classes, campus closed)	June 19
Summer Session 2 (6 weeks)	June 29 - August 7
Independence Day observed (no classes, campus closed)	July 3
Combined Summer Session (12 weeks)	May 18 - August 7

Fall 2026

Syracuse Campus

Classes begin	August 31
Labor Day (no classes)	September 7

Last day to add a class	September 8
Academic Drop Deadline - Last day to drop a class	September 25
Fall break (no classes)	October 12 - 13
Mid-term grading	October 12 - 16
Advising for Spring 2027	November 2 - November 10
Registration for Spring 2027	November 11 - January 1
Thanksgiving Recess (no classes)	November 22 - 29
Last day to withdraw from a class	November 11
Last day of classes	December 15
Reading day	December 16
Final Exams	December 17 - 18
Reading days	December 19 - 20
Final Exams	December 21 - 22
Grades due	December 29

Spring 2027

Syracuse Campus

Classes begin	January 11
Martin Luther King Day (no classes)	January 18
Last day to add a class	January 19
Academic Drop Deadline - Last day to drop a class	February 5
Mid-term Grading	March 1 - 5
Spring break (no classes)	March 7 - 14
Advising for Fall 2027	March 29 - April 6
Registration for Fall 2027	April 7 - June 30
Last day to withdraw from a class	April 16
Last day of classes	April 26
Reading days	April 27 - 28

Final Exams	April 29 - 30
Reading days	May 1 - 2
Final Exams	May 3 - 4
ESF May Commencement	May 8
ESF/SU Joint May Commencement	May 9
Grades due	May 11

Fall 2027

Syracuse Campus

Classes begin	August 30
Labor Day (no classes)	September 6
Last day to add a class	September 7
Academic Drop Deadline - Last day to drop a class	September 24
Fall break (no classes)	October 11 - 12
Mid-term grading	October 18 - 22
Advising for Spring 2028	November 1 - November 9
Registration for Spring 2028	November 10 - December 31
Thanksgiving Recess (no classes)	November 21 - 28
Last day to withdraw from a class	December 3
Last day of classes	December 14
Reading day	December 15
Final Exams	December 16 - 17
Reading days	December 18 - 19
Final Exams	December 20 - 21
Grades due	December 28

Spring 2028

Syracuse Campus

Martin Luther King Day (no classes)	January 17
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Classes begin	January 18
Last day to add a class	January 25
Academic Drop Deadline - Last day to drop a class	February 11
Mid-term Grading	March 6 - 10
Spring break (no classes)	March 12 - 19
Advising for Fall 2028	March 27 - April 4
Registration for Fall 2028	April 5 - June 30
Last day to withdraw from a class	April 21
Last day of classes	May 1
Reading days	May 2 - 3
Final Exams	May 4 - 5
Reading days	May 6 - 7
Final Exams	May 8 - 9
ESF May Commencement	May 13
ESF/SU Joint May Commencement	May 14
Grades due	May 16

Fall 2028

Syracuse Campus

Classes begin	August 28
Labor Day (no classes)	September 4
Last day to add a class	September 5
Academic Drop Deadline - Last day to drop a class	September 22
Fall break (no classes)	October 9 - 10
Mid-term grading	October 16 - 20
Advising for Spring 2029	November 1 - 9
Registration for Spring 2029	November 8 - December 31
Thanksgiving Recess (no classes)	November 19 - 26

Last day to withdraw from a class	December 1
Last day of classes	December 12
Reading day	December 13
Final Exams	December 14 - 15
Reading days	December 16 - 17
Final Exams	December 18 - 19
Grades due	December 26

Spring 2029

Syracuse Campus

Martin Luther King Day (no classes)	January 15
Classes begin	January 16
Last day to add a class	January 23
Academic Drop Deadline - Last day to drop a class	February 9
Mid-term Grading	March 5 - 9
Spring break (no classes)	March 11 - 18
Advising for Fall 2029	April 2 - 10
Registration for Fall 2029	April 11 - June 29
Last day to withdraw from a class	April 20
Last day of classes	April 30
Reading days	May 1 - 2
Final Exams	May 3 - 4
Reading days	May 5 - 6
Final Exams	May 7 - 8
ESF May Commencement	May 12
ESF/SU Joint May Commencement	May 13
Grades due	May 15

Fall 2029

Syracuse Campus

Classes begin	August 27
Labor Day (no classes)	September 3
Last day to add a class	September 4
Academic Drop Deadline - Last day to drop a class	September 21
Fall break (no classes)	October 8 - 9
Mid-term grading	October 15 - 19
Advising for Spring 2030	October 29 - November 6
Registration for Spring 2030	November 7 - December 31
Thanksgiving Recess (no classes)	November 18 - 25
Last day to withdraw from a class	November 30
Last day of classes	December 11
Reading day	December 12
Final Exams	December 13 - 14
Reading days	December 15- 16
Final Exams	December 17 - 18
Grades due	December 26

Spring 2030

Syracuse Campus

Classes begin	January 14
Martin Luther King Day (no classes)	January 21
Last day to add a class	January 22
Academic Drop Deadline - Last day to drop a class	February 8
Mid-term Grading	March 4 - 8
Spring break (no classes)	March 10 - 17
Advising for Fall 2030	April 1 - 9

Registration for Fall 2030	April 10 - June 28
Last day to withdraw from a class	April 19
Last day of classes	April 29
Reading days	April 30 - May 1
Final Exams	May 2 - 3
Reading days	May 4 - 5
Final Exams	May 6 - 7
ESF May Commencement	May 11
ESF/SU Joint May Commencement	May 12
Grades due	May 14

Statement of Academic Integrity

The College of Environmental Science and Forestry is an institution of higher learning where growth and development are fostered, excellence is pursued and the highest standards of academic integrity are expected. The Code of Student Conduct ("the Code") outlines the behaviors that are expected of all students at the College. As a condition of enrollment, all students are required to acknowledge that they have (a) received a copy of the Code; (b) read the Code; (c) understand the provisions of the Code; and (d) agree to abide by the provisions of the Code.

The ESF Student Judicial Handbook and Code of Student Conduct are available [online](#).

College-wide Academic Policies

General Requirements

A student seeking a degree must be in matriculated status. All degree requirements must be completed through a combination of formally accepted transfer credits and/or courses taken at ESF and Syracuse University.

Attendance

Students are expected to adhere to the attendance policy stated by each course instructor. Instructors may make attendance part of the course requirement.

Timely Feedback

Faculty shall provide all students with timely and appropriate feedback regarding their performance and progress toward meeting prescribed learning outcomes on all assigned coursework, projects and examinations.

Course-numbering System

Courses at ESF are numbered according to the following system:

- 100-499 Undergraduate courses for which no graduate credit may be given.
- 500-599 Graduate courses designed expressly for areas of specialization in post-baccalaureate programs. Qualified undergraduate students may enroll with permission of the instructor.
- 600-699 Graduate courses designed expressly for advanced levels of specialization. Undergraduate students with a cumulative grade point average of 3.000 or better may enroll in these courses with an approved petition.
- 700-999 Advanced graduate level courses for which no undergraduate students may register.

Shared resources courses, designated as 400/500 or 400/600, are designed when the topic coverage of both courses is the same. Separate course syllabi are developed expressly differentiating the requirements and evaluative criteria between the undergraduate course and the graduate course. No type of cross listing may be offered unless approved by the ESF faculty.

Courses listed are offered subject to the availability of instructional faculty and sufficient student enrollment. Students and advisors should consult the actual schedule of courses published each semester to determine the availability and time of courses.

Dropping or Adding Courses

For those students receiving financial support through the College, dropping courses that result in the student being less than full time will have an impact on support received. Contact the Office of Financial Aid and Scholarships for more detailed information.

Students may add courses with the approval of both their academic advisor and the course instructor and may drop courses with their advisor/major professor's approval and notification to the course instructor using an appropriate drop/add form until the last day for program adjustments as listed in the ESF academic calendar. Courses dropped during this time will not appear on the student's transcript. Courses that begin after the published add date may be added prior to the start of the course. Courses that last for less than one semester may be dropped no later than halfway through the course. In either case, the student must submit a completed drop/add form. Following the last day to add a class, students may withdraw from individual courses. Withdrawal policies and deadlines are described in the **Withdrawal from Individual Courses** section below.

Incomplete and missing grades

A temporary grade of I may be assigned by an instructor only when the student has nearly completed the course but because of significant circumstances beyond the student's control the work is not completed. Grades of I should be resolved within one academic year. If the incomplete is not resolved within one year, it will be changed to a grade of I/F or I/U, depending on the grading basis for the course. No degree will be conferred until all grades of I have been resolved.

Repeating Courses

Undergraduate students may repeat any course previously taken either to earn a higher grade or because of a previous failure. Courses taken at ESF or Syracuse University that contribute to the GPA may be repeated. Ability to repeat a course may be limited by space availability, providing priority for first time registrants.

Repeated courses will be reported as follows: a) the original and the repeated grade(s) appear on the transcript; b) only the higher (or highest) grade is included in the calculation of the cumulative grade point average. The highest grade will be marked with an "I" for included to show that it is included in the cumulative GPA. Any other grades will be marked with an "E" for excluded to show that it is excluded from the cumulative GPA.

When a student earns the same grade in a repeated course a) the grade is calculated once in the cumulative grade point average and b) the credits and quality points are applied to the most recent term or semester in which the grade was earned. Credit hours for the repeated course may be counted only once toward meeting graduation requirements.

For state-based financial aid, repeated courses in which students have received a passing grade will not count toward full time status. Students retaking courses may find their financial aid reduced if they fall below 12 credits when the retaken courses are not included. Students should contact the Financial Aid Office to determine the impact of retaking courses on their financial aid. Students receiving Federal Aid may repeat a previously passed course one time and still receive aid. Students may receive aid for previously failed courses that are repeated more than once. All repeated courses count as attempted credits for the purposes of measuring Satisfactory Academic Progress.

Exceptions to Curriculum and Academic Policy Requirements

Exceptions to academic policies stated in this document and curriculum requirements may be made by the Faculty Subcommittee on Academic Standards, which also may delegate this authority. Exceptions may not violate standards established by the State University of New York or the New York State Education Department.

Exceptions must be requested on a petition form and must have a recommendation from the student's advisor and department chair or designee. In those cases where an action is requested involving a specific course, the petition must also have a recommendation from the course instructor.

Withdrawal from ESF

Students who withdraw from matriculation at the College on or before the last day of classes for a semester will have their records marked: "Withdrew on (date)." Courses will appear for that semester with the grade of W.

Students who wish to withdraw from ESF should schedule a meeting to review the withdrawal process and complete an exit interview in the Office of Student Affairs.

- www.esf.edu/student-affairs/academic-support/

If a student registers but then leaves without notifying the College of their intent to withdraw, the student will continue to incur tuition, room, board, and other charges.

Course registrations will remain, and any grades submitted by the student's instructors will be recorded on the student's transcript. A student cannot receive Incomplete grades for courses in which the student was enrolled if the student takes a leave of absence or is withdrawn before the end of the semester; only grades of W or F can be recorded on the student's transcript. If a student registers for a future semester and subsequently takes a leave of absence or is withdrawn, then the student's registration for that semester will be canceled. For students who do not register at all, they will be automatically withdrawn from the college, and the notation "did not register" will also be recorded on their transcript. Students who do not register and are subsequently withdrawn must follow formal readmission procedures.

Withdrawal from Individual Courses

Students may drop individual courses up until the **last day to add** as set by the Registrar in the ESF Academic Calendar using an **add/drop form**. Dropped courses during this period will be completely removed from the transcript when dropped on or before this deadline.

Deadlines and actions to be taken after the last day to add deadline are:

- **Last day to add – Week 4:** After the **last day to add** (as per the academic calendar), students may drop a course without record of registration, until the end of the 4th week of classes.
- **Weeks 5-14:** Students who withdraw from a course after the last day of the **4th week and by the last day of the 14th week** will receive a W (Withdraw) grade on their permanent transcript, and the student(s) will remain on the course roster. The W grade will not affect the GPA.

Precise deadline dates noting the official end of weeks above shall be listed on the ESF Academic Calendar found on the Registrar's webpage (www.esf.edu/registrar/calendar.php)

Readmission to ESF

Students wishing to return to ESF **must** apply for readmission by contacting the Office of the Dean for Student Affairs at least 45 days prior to the semester they wish to return. Readmission applies to those students returning from a leave of absence (medical or military), who withdrew from the college, or have been dismissed for academic or disciplinary reasons.

- www.esf.edu/student-affairs/academic-support/

Resumption of Degree Programs

Students who have withdrawn from matriculated status in a degree program at ESF may seek to resume or complete a degree program with the following conditions:

1. A former student **must** apply for either:
 - Readmission and resumption of the student's original degree program and curriculum as described in the college catalog at the time of the student's original matriculation; or transfer of additional credit from another university sufficient to complete content or credit-hour requirements of the student's original degree program.
 - Readmission to complete a current ESF degree program and curriculum as described in the current college catalog; or transfer of additional credit from another university sufficient to complete content or credit hour requirements of a current ESF degree program.
2. Resumption and completion of original degree programs is permissible only if application for readmission is made no more than **10 years** after the student's original matriculation at ESF.
3. Degree completion will be posted to the academic record in the term when the last program requirement was completed. Degrees may not be conferred retroactively.
4. Students whose case exceeds the statute of limitation for degree resumption (i.e. 10 years as noted in (2.) above) will be advised by the department regarding those current programs that the student may pursue that most closely match his or her previously completed coursework. Past coursework may be accepted toward completion of a current degree program at the discretion of the department.

In the event of a dispute resulting from departmental or administrative review of a returning student's academic record, final authority regarding the completion of curricular requirements for degree programs rests with the college President, within the limits prescribed by the New York State Department of Education (such as those requiring a minimum number of total credit hours, etc.).

Syracuse University Courses

Courses offered at ESF should be taken at Syracuse University only under extraordinary conditions authorized by the department chair or designee. Students who propose to register for Syracuse University courses and no courses at ESF during any semester may do so only upon acceptance to special ESF-SU cooperative programs that require block registration. Students who are in their final semester may register for no more than six credits of Syracuse University courses beyond those necessary to meet ESF requirements.

Syracuse University courses may be audited only under extraordinary conditions that must be approved by the department chair or designee. Physical education courses, when taken, must always be for credit and never audited. Students may not retake Syracuse University courses in which credit has been previously earned.

Upper-division undergraduate students are normally expected to take upper-division courses and graduate students are normally expected to take graduate-level courses at Syracuse University.

Religious Beliefs Law

Students unable, because of religious beliefs, to attend classes on certain days are guided by Section 224a of the New York State Education Law, which is as follows:

- No person shall be expelled from or be refused admission as a student to an institution of higher education for the reason that one is unable, because of religious beliefs, to attend classes or to participate in any examination, study or work requirements on a particular day or days.
- Any student in an institution of higher education who is unable, because of religious beliefs, to attend classes on a particular day or days shall, because of such absence on the particular day or days, be excused from any examination or any study or work requirements.
- It shall be the responsibility of the faculty and of the administrative officials of each institution of higher education to make available to each student who is absent from school because of religious beliefs an equivalent opportunity to make up any examination, study or work requirements which may have been missed because of such absence on any particular day or days. No fees of any kind shall be charged by the institution for making available to the said student such equivalent opportunity.
- If classes, examinations, study or work requirements are held on Friday after four o'clock post meridian or on Saturday, similar or makeup classes, examinations, study or work requirements shall be made available on other days, where it is possible and practicable to do so. No special fees shall be charged to the student for these classes, examinations, study or work requirements held on other days.
- In effectuating the provisions of this section, it shall be the duty of the faculty and of the administrative officials of each institution of higher education to exercise the fullest measure of good faith. No adverse or prejudicial effects shall result to any student because of implementation of the provisions of this section.
- Any student, who is aggrieved by the alleged failure of any faculty or administrative officials to comply in good faith with the provisions of this section, shall be entitled to maintain an action or proceeding in the supreme court of the county in which such institution of higher education is located for the enforcement of rights under this section.

Grade Grievances/Appeals

Assignment of grades is at the discretion of the Instructors of Record. However, assignment of grades must not be arbitrary or prejudicial; all students must be treated equally and in accordance with grading policies articulated in the course syllabus. Grade grievances, therefore, are restricted to claims of arbitrary or prejudicial grading practices. Third party grade grievances will not be accepted.

Undergraduate Academic Policies

General Requirements

While a student is matriculated at ESF, all courses taken at ESF and Syracuse University to meet degree requirements must be graded on a scale of A-F, and the grades will be computed in the grade point average. As an exception, at the discretion of the instructor, courses numbered 132, 496 and 497 may be graded on a Satisfactory/ Unsatisfactory basis. This must be announced on the first day of class and will apply to all students enrolled in that course section.

Curriculum Requirements

The development and administration of course offerings, prerequisites, sequencing and program requirements are primarily the responsibility of each program with the approval of the ESF faculty.

Students must satisfy the requirements for graduation presented in the catalog in effect as of the date they first matriculated at ESF. Students may graduate under the requirements stated in any catalog issued subsequent to the one in effect the date they matriculated, but they may not use a prior catalog.

Supplementary courses are available to ESF students at Syracuse University. However, these courses may be limited only to those specifically required by a particular program.

Students who change majors are required to submit a completed change of curriculum form approved by representatives of both programs and must complete all the requirements of their new major.

Applied Learning

Each undergraduate student shall complete an approved “applied learning experience” as a curricular requirement for degree completion at SUNY-ESF.

Dual Majors

Students who are pursuing undergraduate degrees may pursue dual majors. Program requirements must be satisfied concurrently (i.e., a student cannot graduate from ESF and return later to complete coursework for a second major). The diploma will state the completion of a single degree. The transcript will state the completion of two majors. Admission to a dual major will be accomplished by petition to the primary degree department or academic unit that has been endorsed (approved) by the secondary degree department.

Inter-department dual majors:

Students must satisfy requirements of both majors.

Intra-department dual majors:

- **PBE:** Bioprocess Engineering allowed with Paper Engineering;
- **SRM:** no dual majors between the three majors (FRM, NRM, and FES); forest technology and surveying technology degrees allowed for A.A.S. degrees;
- **EFB:** Only Biotechnology with other EFB majors **except environmental biology**.

Students may petition for admission to a dual major A.A.S. degree after completing 18 credits and before 45 credits with an unambiguous GPA of 2.000 or greater (no grades of incomplete or missing grades).

Students pursuing the B.S. degree may petition admission to a dual major after completing 30 credits and before completing 90 credits in the primary major with an unambiguous GPA of 2.000 or greater (no grades of incomplete or missing grades).

Physical Education and ROTC

Physical Education and ROTC course credits may be used to satisfy elective requirements with the permission of the student's academic advisor.

General Education

Resolution 98-241 (December 1998) of the State University Board of Trustees requires general education coursework for all University baccalaureate candidates in specific knowledge and skill areas and in two competencies. Each ESF undergraduate program meets or exceeds the general education requirements. These general education requirements are in effect for all students who began college courses during or after the fall semester 2000, exclusive of any courses taken while in high school.

On **November 9, 2021**, the SUNY Board of Trustees passed Resolution 2021-48 establishing the new SUNY General Education Framework (SUNY GE). The new SUNY GE policy is consistent with SUNY's continuing commitment to a strong general education program—now applicable to all SUNY undergraduate degree programs—that addresses the fundamental aims of postsecondary undergraduate education. This includes proficiency with essential skills and competencies, familiarization with disciplinary and interdisciplinary ways of knowing, enhancement of the values and disposition of an engaged 21st century global citizenry, and encouragement of individual campuses to develop unique signature features, including their respective array of educational offerings and pedagogical approaches.

The SUNY General Education Framework is effective fall 2023, for new first-time students entering AA-, AS-, and all baccalaureate-degree programs; and effective fall of 2024, for new first-time students entering AAS- and AOS-degree programs.

Credit-Hour Load

To be classified as full time, a student must register for at least 12 credit hours during a semester. A student may not register for more than 18 credits during a semester unless permission from the student's advisor is obtained.

Audits

Students may audit ESF courses informally with the permission of the course instructor. No record will be maintained of the informal audit nor will any grade be assigned. No fee is required for informal audits.

Students may audit courses formally with the permission of their academic advisor and the course instructor. Formally audited courses may not be used to satisfy any graduation requirements. They will appear on a student's transcript and will be graded either SAU (satisfactory audit) or UAU (unsatisfactory audit). The grade will be assigned based on the criteria

for audit established by the course instructor. Registration guidelines for audited courses are the same as for courses taken for credit.

Evaluation

For each course completed, one of the following grades will be awarded:

Grade	Definition	Grade Points
A	Excellent	4.000
A-		3.700
B+		3.300
B	Good	3.000
B-		2.700
C+		2.300
C	Passing	2.000
C-		1.700
D	Minimum Passing	1.000
F	Failure	0.000
I/F	Unresolved Incomplete	0.000

In order to receive a bachelor's degree, a student must complete all courses taken as a matriculated student at ESF with a cumulative grade point average of at least 2.0.

Under conditions defined elsewhere, the following grades may be assigned, none of which yield grade points:

Grade	Definition
S	Satisfactory (equal to C or better)
U	Unsatisfactory (equal to below C)
W	Withdraw
WP	Withdraw Passing
WF	Withdraw Failing
SAU	Audit (Satisfactory)
UAU	Audit (Unsatisfactory)
I	Incomplete
R	Failed course which was repeated

NR	[Grade] Not Received
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Grade Point Averages

Semester and cumulative averages are computed by dividing the total grade points earned by the total credit hours completed for all courses graded A-F.

Mid-term Grading Policy

Faculty shall provide mid-term grades for undergraduate students only. Such grades are a progress report for the undergraduate students to serve as an evaluation of the quality of the work to date. Mid-term grades are informational, therefore do not become part of the student's permanent record.

Mid-term grades shall be submitted within seven (7) calendar days after the designated midterm date set by the Registrar's Office. These grades should reflect the standing of each student based on the current coursework completed.

Academic Advising

Each undergraduate student is assigned an academic advisor in the student's major. The advisor assists the student in developing a program of study and approves course registration each semester. The advisor serves as a mentor and counselor and makes referrals to appropriate offices and resources as needed. The curriculum coordinator of each of the departments also assists the student by clarifying program and course requirements and providing additional advising and career-planning information.

Academic Honors

Dean's List

Students who carried 12 or more credits of coursework graded on a scale of A-F, with no grades of I or F in that semester, with a minimum grade point average of 3.500 will be placed on the Dean's List for that semester. Any grade changes, resolution of grades, or repeated courses after Dean's List Honors are awarded do not qualify a student to be placed on the Dean's List retroactively. A commendation is sent by the Dean to the student.

President's List

Students who carried 12 or more credits of coursework graded on a scale of A-F with no grades of I or F in that semester, with a grade point average of 3.850 or better will be placed on the President's List for that semester. Any grade changes, resolution of grades, or repeated courses after President's List Honors are awarded do not qualify a student to be placed on the President's List retroactively. A commendation is sent by the President to the student.

Students who carried 12 or more credits of coursework graded on a scale of A-F with no grades of I or F in that semester, with a grade point average of 4.000 will receive an additional commendation from the President.

Graduation Requirements

Students pursuing an associate of applied science's degree are responsible for meeting the following requirements for graduation:

- Matriculated status as an undergraduate student;

- All program requirements must be satisfied;
- A minimum cumulative grade point average of 2.000 (4.000=A) for all courses taken as a matriculated student at the Ranger School (Wanakena Campus);
- At least 44 of the 64 credits must be registered for through ESF;
- Successful completion of a total of at least 64 appropriate college-level credits.

Students pursuing a bachelor's degree are responsible for meeting the following requirements for graduation:

- Matriculated status as an undergraduate student;
- All program requirements must be satisfied;
- A minimum cumulative grade point average of 2.000 (4.000=A) for all courses taken as a matriculated student at ESF;
- At least 24 of the last 30 credits must be registered for through ESF;
- Successful completion of a total of at least 120 appropriate college-level credits.

Graduation Honors

Students will be graduated with the appropriate honor if the following criteria have been met:

- Students have completed a minimum of 30 credits of ESF and Syracuse University courses as a matriculated, upper-division student, and
- Students have earned a cumulative grade point average of 3.000-3.333 (*cum laude*); 3.334-3.829 (*magna cum laude*); or 3.830-4.000 (*summa cum laude*).

Statement of Good Academic Standing

Students are in good standing when their semester and cumulative grade point average is 2.0 or greater and they have successfully completed at least 12 credits when registered full-time.

Progress Notice

Students are on progress notice who have a cumulative GPA above a 2.0 and a semester GPA below a 2.0 for the most recently completed semester; or a student who has not successfully completed at least 12 credits when registered full-time in the most recently completed semester. Students on progress notice receive a reminder of policies and resources available for support, but there is no academic penalty. Please refer to Financial Aid guidelines for further guidelines on successful academic progress.

Academic Warning

Students who have earned less than a 2.0 cumulative GPA are placed on academic warning at the end of the semester. Students on Academic Warning must participate in the Academic Recovery Program with the Academic Success Center each semester that they are on Academic Warning. With permission of the student's advisor, students may participate in an equivalent academic success program offered at ESF (e.g. EOP Academic Recovery Program).

Note: Academic Warning status is evaluated at the end of the fall and spring semesters. Changes to grades from a previous semester or summer course grades will not change your warning status.

Academic Suspension

Students who were placed on academic warning at the end of the previous semester and who have a cumulative GPA below a 2.0 and a semester GPA below a 2.0 for the current semester will be placed on academic suspension.

Academic Suspension Policy for Educational Opportunity Program Students:

Students enrolled through the Educational Opportunity Program may be granted an additional semester on Academic Warning before they are subject to Academic Suspension, even if their cumulative GPA is below a 2.00, by permission of the Educational Opportunity Program Director and the Associate Provost of Academic Affairs.

Appeal to Academic Suspension

Each student placed on academic suspension will be given the opportunity to appeal this action based on any extraordinary conditions that may have contributed to their academic performance. This appeal must be made in writing and submitted within the stated time limit in accordance with guidelines provided by the Office of Academic Administration. Every appeal will be reviewed by the Academic Standards Committee, which will recommend to the Associate Provost of Academic Affairs either to accept the appeal or sustain the suspension. Students will be notified in writing of the final decision. The committee decision is final and there is no further appeal beyond this process.

Students who have been suspended may not enroll in any courses at ESF until at least one fall or spring semester has elapsed. If suspension occurs following the spring semester, students may not enroll in a summer classes at ESF or SU.

Reinstatement after Academic Suspension

After one full fall or spring semester has elapsed, students may apply for readmission through the Office of Student Affairs. Applications for readmission must be started at least 45 days prior to the semester the student wishes to return.

Academic Dismissal

Students suspended a second time for unsatisfactory academic performance, consistent with all policies noted above, and without a successful appeal will be dismissed from ESF and may not be considered again for readmission. If, however, after a period of not less than 10 years has elapsed, a previously dismissed student should desire to return to ESF, they may then apply for readmission. Candidates for readmission under these unusual conditions will be considered on a limited, case-by-case basis, and may be required to provide substantial additional justification for readmission. For information regarding Satisfactory Academic Progress for financial aid eligibility, please refer to the Financial Aid section of this catalog.

***Due to the unique accelerated nature of programs offered at The Ranger School in Wanakena, students matriculated in these programs are not subject to these policies and may be placed on academic warning or suspension at any time their semester or cumulative GPA falls below 2.000.**

Graduate Academic Policies

General Requirements

While a student is matriculated at ESF, all coursework taken at ESF and Syracuse University to meet degree requirements must be graded on a scale of A-F, and the grades will be computed in the grade point average. As an exception, at the discretion of the instructor, courses numbered 796 and 797 may be graded on a Satisfactory/Unsatisfactory basis. This must be announced on the first day of class and will apply to all students enrolled in that course section. Courses numbered 898, 899 and 999 are graded on a Satisfactory/Unsatisfactory basis.

Curriculum Requirements

The development and administration of course offerings, prerequisites, sequencing and program requirements are primarily the responsibility of each program with the approval of the ESF faculty.

Students must satisfy the requirements for graduation presented in the catalog in effect as of the date they first matriculated at ESF. Students may graduate under the requirements stated in any catalog issued subsequent to the one in effect the date they matriculated, but they may not use a prior catalog.

Transfer Credit

Credit hours appropriate to the graduate degree in which a minimum grade of B was earned from an accredited institution can be transferred to the College, but grades and grade points cannot be transferred.

Up to six credits of graduate coursework not used to complete another degree may be accepted toward completion of a master's or doctoral degree as approved by the steering committee.

Up to 30 credits of graduate level coursework earned as part of a conferred master's degree may be transferred (by petition) to a doctoral degree with approval of the steering committee.

Students may transfer no more than nine credits of credit-bearing non-degree ESF coursework to graduate degree programs.

All transfer credit will remain tentative until official, final transcripts are received. It is the student's responsibility to ensure that official, final transcripts are sent to and received by the College.

Credit-Hour Load

To meet academic requirements, graduate students must be registered for at least one credit each semester, excluding summers, from the first semester of matriculation until all degree requirements have been completed. Failure to register for each semester will result in the student being withdrawn from graduate study and, if the student wishes to return in the future, a new application must be filed and reviewed prior to readmission. Students are required to register for at least one credit of thesis/dissertation research, professional experience, or independent study in the summer if they will complete all requirements during that time. Graduate students who hold an assistantship and/or a tuition scholarship must be in full-time status each semester while holding such an award. Registration for nine credits usually equates to full-time status for a student holding an assistantship. Graduate students not holding an assistantship are considered full-time if they are registered for at least 12 credits each semester. To maintain valid F-1 or J-1

student status in compliance with SEVIS, international students are required to maintain the institutional equivalent of full-time enrollment status during all required academic semesters. Audited courses may not be used to satisfy full-time status. Undergraduate courses may not be used to satisfy full-time status requirements for federal and state financial aid (TAP) but may be applied toward full-time status requirements for SEVIS. Student loan deferrals may be maintained by achieving half-time status for graduate students, or approximately 6 credit hours, if full-time status is not required for other reasons.

Doctoral candidates (i.e., those who have successfully completed their doctoral candidacy examination), master's students (M.P.S., M.L.A., and M.F.) who have met all academic coursework requirements, and master of science (M.S.) students who have requested the appointment of a defense committee and intend to defend a thesis may be considered full time if registered for at least one credit of thesis/dissertation research, professional experience, or independent study and submit a "Request for Full-time Certification Form" to the Office of Instruction and Graduate Studies.

Part-Time Study

During any semester, students who are enrolled in part-time graduate degree programs (M.F. or M.P.S.) may register for the equivalent of full-time study. Graduate students who are enrolled in part-time degree programs are held to the policy for continuous registration, but not to the policy for time to degree (delimitation).

Re-enrollment

Full and part-time students in good academic standing who have a 1 to 2 semester lapse in registration may, with permission of their major professors or advisors, re-enroll for classes by filling out this [form](#). Students whose last enrollment status was "visitor" or who were suspended for unsatisfactory academic performance must use an admission application form. Students who have not been enrolled at the college for a period of more than 1 academic year must also re-apply.

Audits

ESF Courses may be audited formally or informally, and informally with special audit status. Each is defined as follows:

- **Formal Course Audit:** A course may be audited formally by registering for a course using the standard course registration process. Formally audited courses do not carry course credit and may not be used to satisfy any graduation requirements. They will appear on a student's transcript and will be graded either SAU (satisfactory audit) or UAU (unsatisfactory audit). The grade will be assigned based on the criteria for audit established by the course instructor. Both matriculated and non-matriculated students may formally audit courses.
- **Informal Course Audit:** A course may be informally audited by gaining permission of the instructor. No record will be maintained of the informal audit nor will any grade be assigned. No fee is required for informal audits. Only matriculated ESF students may informally audit courses.
- **Special Informal Course Audit:** "Special audit status" is granted to all New York state citizens of age 60 and over. Courses may be audited informally with special audit status by requesting confirmation of available space from the Office of Outreach and Instructional Quality. A record of the number of special auditors participating in each course is kept, however, no individual transcript is maintained of special informal audits nor will any grade be assigned. No fee is required for informal special audits.

Evaluation

For each course completed, one of the following grades will be awarded:

Grade	Definition	Grade Points
A	Excellent	4.000
A-		3.700
B+		3.300
B	Satisfactory	3.000
B-		2.700
C+		2.300
C		2.000
C-	Minimum Passing	1.700
F	Failure	0.000
I/F, I/U	Unresolved Incomplete	0.000

Under conditions defined elsewhere, the following grades may be assigned, none of which yield grade points:

Grade	Definition
W	Withdraw
WP	Withdraw Passing
WF	Withdraw Failing
S	Satisfactory (equal to B or better)
U	Unsatisfactory (equal to below B)
SAU	Audit (Satisfactory)
UAU	Audit (Unsatisfactory)
I	Incomplete
NR	[Grade] Not Received

Grade Point Average

Semester and cumulative averages are based on graduate-level courses only and are computed by dividing the grade points earned by the credit hours completed in all courses graded A-F.

Time Limits

Graduate students must complete all requirements for the master of forestry, master of professional studies, the master of landscape architecture, and the master of science degree within four years of the first date of matriculation or they may be withdrawn from graduate study. For the doctoral degree, students must complete the candidacy exam within three years of the first date of matriculation. Students must pass the doctoral candidacy examination covering selected fields of study at least one year prior to dissertation defense. Doctoral candidates must successfully defend the dissertation and complete all degree requirements within seven years of matriculation, or they will be required to retake the candidacy examination or be withdrawn from their program of graduate study.

Graduation Requirements

Students are responsible for meeting the following requirements for graduation:

- Matriculated status as a graduate student;
- All requirements for the appropriate program and degree level must be satisfied, and
- A minimum cumulative grade point average of 3.000 (4.000 = A) for all courses taken as a matriculated student at ESF.

Academic Performance

Students who earn less than a 3.000 cumulative grade point average for graduate-level courses, or who receive two or more grades of Unsatisfactory (U) for work on their thesis or dissertation shall have their records reviewed by the Dean of Instruction and Graduate Studies. These students shall be either placed on academic probation or suspended from ESF. The action taken will be based on recommendations from the students' major professors, department chairs and other appropriate faculty and staff. If, in a subsequent semester, a graduate student in probationary academic status achieves a grade of Satisfactory (S) on their thesis or dissertation work, they shall be removed from probationary academic status. The Dean of Instruction and Graduate Studies will inform each student in writing of actions taken. When a student is removed from probationary academic status, the Dean of Instruction and Graduate Studies will additionally notify the student's major professor and committee members.

Each student suspended will be given the opportunity to appeal this action based on any extraordinary conditions which may have contributed to the unsatisfactory performance. This appeal must be made in writing and submitted to the Office of Instruction and Graduate Studies within the stated time limit. Each appeal will be reviewed by the Faculty Subcommittee on Academic Standards which will recommend to the dean of Instruction and Graduate Studies either to sustain the suspension or place the student on probation. The dean of Instruction and Graduate Studies will inform each student in writing of the Subcommittee action. There is no appeal beyond this process.

Students who have been suspended for unsatisfactory academic performance may not reapply until at least one semester has elapsed. Students may not take any courses at ESF or Syracuse University during this first semester following suspension. Suspended graduate students who wish to be readmitted must apply for readmission through the Office of Instruction and Graduate Studies.

Students suspended from a graduate degree program for a second time for unsatisfactory academic performance may not be considered for readmission.

ADMISSION POLICIES & REQUIREMENTS

NOTE: The following information on admission to SUNY ESF is limited to specific policies and requirements necessary for inclusion in a catalog of record.

For complete, current information on admission to ESF, visit our admission websites:

- www.esf.edu/admissions/undergraduate/
- www.esf.edu/graduate/prospective/admission.php
- www.esf.edu/international-education (undergraduate and graduate)

Student Status

Required Application Materials

All applicants for first year or transfer entry are required to submit the online admissions application (choose either the Apply SUNY application or The Common Application), official high school transcript or documentation of high school graduation (or equivalent) and any college-level coursework (or equivalent) completed, even if it does not pertain to their intended program of study at ESF. Additional required credentials for each admission pathway are outlined below. Failure to submit this documentation by the stated deadlines may result in the withdrawal of the application or denial of admission.

Early Action First Year Admission for High School Seniors

The application and official high school transcripts, including 12th-year first-quarter grades must be received by this date. Please refer to the next section, "Regular First Year Admission for High School Seniors," for additional information on the first year application process.

Regular First Year Admission for High School Seniors

High school seniors may apply for Regular First Year admission. High school seniors who are not offered first year entry may be offered Guaranteed Transfer. Please refer to the next section, "Guaranteed Transfer Option for High School Seniors," which explains this process.

First Year applicants should present strong academic credentials in a college preparatory high school curriculum. A minimum of three units each of college preparatory mathematics and science are required for all majors. For most programs of study completion of additional units of math and science, or design or art sequences for Landscape Architecture applicants, as well as advanced level coursework (honors or college level) indicates strong preparation for the academic rigor students will experience at ESF. An official high school transcript, including 12th-year first-quarter grades, must be submitted as part of the student's application credentials. First Year applicants are encouraged to submit the ESF Supplemental Questions. They are available on the applicant portal when the application is received.

Guaranteed Transfer Option for High School Seniors

Under this option, admitted students are guaranteed admission to ESF for either their sophomore or junior year provided they meet the conditions specified in the offer of Guaranteed Transfer. Guaranteed Transfer applicants may file the SUNY application or the Common Application as

outlined in the section above and send an email to esfinfo@esf.edu indicating the entry semester for which they wish to be considered. Applicants must submit the same credentials as outlined under "Regular First Year Admission for High School Seniors" (see preceding section). Successful applicants for this option must present a strong academic background including at least three years each of college preparatory mathematics and science. First year applicants who are not offered admission may be offered Guaranteed Transfer. To satisfy the guarantee of admission, students must satisfactorily complete, with a minimum cumulative grade point average of 2.80 for bachelor's degree programs and 2.50 for associate degree programs (A=4.000), any of the lower-division requirements, which are part of their program of study. Only coursework with grades of C or higher will transfer to meet ESF degree requirements.

Regular Transfer Admission for College Students

Transfer students' admissibility is based on how much of their previous college-level coursework applies to the requirements of their intended major at ESF, overall academic performance at their previous colleges and specific interest in ESF programs. For most programs, a significant emphasis is placed on students' backgrounds in mathematics and science.

Transfer applicants must submit official transcripts and examination scores from all college-level coursework completed and an official final high school transcript or equivalent. Transfer applicants are encouraged to submit the ESF Supplemental Questions. They are available on the Applicant Portal when the application is received. Students who have completed less than 30 semester hours of college-level coursework are required to submit copies of their high school transcript and SAT I or ACT test scores as part of the admissions process.

Students who apply as transfers to ESF are expected to have successfully completed some portion of the established required sequence of courses appropriate to their intended major at the College. Applicants to Landscape Architecture should have some background in art or graphic design. Students attending one of our ESF Cooperative College Partners will find information on course equivalencies for all of our programs of study on our web page.

Transfer students applying for bachelor degree programs at the Syracuse campus should have a 2.80 (A=4.00) or higher cumulative grade point average at the last institution they attended in full-time status. Those applying for associate degree programs at The Ranger School campus should have a 2.50 or higher cumulative grade point average at the last institution they attended in full-time status. Applicants with cumulative grade point averages below these thresholds will be considered on a case-by-case basis. In some cases, transfer applicants may be updated for consideration for a future entry date, one or two semesters beyond their original entry date, to allow them the opportunity to complete additional core degree requirements and/or improve academic performance. Students with cumulative grade point averages less than 2.00 will not be considered for transfer admission to SUNY ESF. Only coursework with grades of C or higher will transfer to meet ESF degree requirements.

Transfer Credit

Coursework appropriate to the ESF curriculum can be transferred to the College, but grades and grade points cannot be transferred. Courses transferred to meet graduation requirements for any curriculum must be acceptable in content, and credit will be awarded only for those completed with a grade of C or higher (a C- is not acceptable).

All transfer credit will remain tentative until official, final transcripts are received. It is the student's responsibility to ensure that official, final transcripts are sent to and received by the College.

Only coursework completed at institutions that are fully accredited by one of six regional accrediting agencies will be considered for possible transfer credit toward ESF degree requirements. These agencies are the Middle States Association of Colleges and Schools, New England Association of Schools and Colleges, North Central Association of Colleges and Schools, Northwest Association of Schools and Colleges, Southern Association of Colleges and Schools, and Western Association of Schools and Colleges.

Policy for Students Transferring from Syracuse University to SUNY ESF

With the approval of the home institution and subject to availability, SUNY ESF students may take Syracuse University courses, and SU students may take SUNY ESF courses.

For Syracuse University transfer students, Syracuse University is the college of record. SUNY ESF does not maintain a transcript record of ESF courses taken by Syracuse University students. A student previously matriculated at Syracuse University, who is subsequently admitted to SUNY ESF, will have all coursework taken while a Syracuse University student, including SUNY ESF courses, treated and evaluated as transfer credit from Syracuse University. Such Syracuse University courses will not appear or calculate on the SUNY ESF transcript, except as they are included in a block of transfer credits, i.e., total credit hours, accepted from Syracuse University. However, such Syracuse University courses do not count toward the SUNY ESF residency requirement. Departments at their discretion include such courses in manual calculations, e.g., for determination of subsequent intra-university transfer eligibility.

Syracuse University courses taken by matriculated ESF students appear on the SUNY ESF transcript and calculate in the same way as ESF courses. Syracuse University courses do not count toward the SUNY ESF undergraduate residency requirement.

The ESF transfer credit policy requiring a minimum grade of C will be waived for Syracuse University students only and any coursework taken at Syracuse University with a passing grade will be treated as if it was taken at SUNY ESF.

Advanced Placement

The College will consider for advanced standing credit the results of examinations from standardized testing agencies such as the College Entrance Examination Board's Advanced Placement Program (AP) or the College Level Examination Programs (CLEP) as well as the Higher Level Exams of the International Baccalaureate (IB) program.

AP Course Score Requirements

Course	Score
Art History	3 or higher
Biology	4 or higher
Chemistry	4 or higher
Chinese	3 or higher
Computer Science A	3 or higher

Computer Science AB	3 or higher
English: Language & Composition	3 or higher
English: Literature & Composition	3 or higher
Environmental Science	3 or higher
European History	3 or higher
United States History	3 or higher
Economics: Microeconomics	3 or higher
Economics: Macroeconomics	3 or higher
French Language	3 or higher
French Literature	3 or higher
German Language	3 or higher
Human Geography	3 or higher
Italian	3 or higher
Japanese	3 or higher
Latin	3 or higher
Latin: Literature	3 or higher
Mathematics: Calculus AB	4 or higher
Mathematics: Calculus BC	4 or higher
Music Theory	3 or higher
Physics B	4 or higher
Physics 1 (effective fall 2014)	4 or higher
Physics 2 (effective fall 2014)	4 or higher
Physics C (Mechanics)	4 or higher
Physics C (Electricity & Magnetism)	4 or higher
Psychology	3 or higher
Spanish Language	3 or higher
Spanish Literature	3 or higher
Statistics	3 or higher
Government & Politics: United States	3 or higher

Government & Politics: Comparative	3 or higher
Art 2D design	3 or higher
Art 3D design	3 or higher
Art Drawing	3 or higher
World History	3 or higher

IB Requirements

Course	Score
Arabic Language B (HL)	5 or higher
Biology (HL)	5 or higher
Business Management (HL)	5 or higher
Business Organization (HL)	5 or higher
Chemistry (HL)	5 or higher
Chinese A-1 (HL)	5 or higher
Classical Languages (HL)	5 or higher
Computer Science (HL)	5 or higher
Design Technology (HL)	5 or higher
Economics (HL)	5 or higher
English A1 (HL)	5 or higher
English A2 (HL)	5 or higher
Film (HL)	5 or higher
Geography (HL)	5 or higher
French A2 (HL)	5 or higher
French B (HL)	5 or higher
History (HL) – Africa	5 or higher
History (HL) – Americas	5 or higher
History (HL) – East and South Asia	5 or higher
History (HL) – Europe	5 or higher
History (HL) – South Asia and the Middle East	5 or higher

Islamic History (HL)	5 or higher
Information Technology (HL)	5 or higher
Japanese B (HL)	5 or higher
Korean (HL)	5 or higher
Mongolian A1	5 or higher
Music (HL)	5 or higher
Philipino Language (HL)	5 or higher
Philosophy (HL)	5 or higher
Physics (HL)	5 or higher
Psychology (HL)	5 or higher
Social and Cultural Anthropology (HL)	5 or higher
Spanish Language A2 (HL)	5 or higher
Spanish Language B (HL)	5 or higher
Theater Arts (HL)	5 or higher
Visual Arts (HL)	5 or higher

CLEP Requirements

Course	Score
COMPOSITION AND LITERATURE	
American Literature	50
Analyzing and Interpreting Literature	50
College Composition	50
College Composition with Modular	50
First Year College Composition	50
English Composition with or without Essay	50
English Literature	50
Humanities	50
FOREIGN LANGUAGES	
French - Level 1	50

French - Level 2	59
German - Level 1	50
German - Level 2	60
Spanish - Level 1	50
Spanish - Level 2	63
HISTORY AND SOCIAL SCIENCES	
American Government	50
Introduction to Educational Psychology	50
History of the United States I: Early Colonization to 1877	50
History of the United States II: 1865 to the Present	50
Human Growth and Development	50
Principles of Macroeconomics	50
Principles of Microeconomics	50
Introductory Psychology	50
Social Sciences and History	50
Introductory Sociology	50
Western Civilization I: Ancient Near East to 1648	50
Western Civilization II: 1648 to the Present	50
SCIENCE AND MATHEMATICS	
College Algebra	50
College Algebra – Trigonometry	50
Calculus	50
Natural Sciences	50
Trigonometry	50
Pre-calculus	50
BUSINESS	
Principles of Accounting	50

Introductory Business Law	50
Financial Accounting	50
Information Systems and Computer Applications	50
Principles of Management	50
Principles of Marketing	50

Ranger School Admission

The SUNY ESF Ranger School does not enroll first year students. Students complete their first year requirements at ESF's Syracuse campus or at the college of their choice. They complete the sophomore year of their A.A.S. program in residence at The Ranger School campus. Candidates may apply for acceptance into these programs under the guaranteed transfer option while a senior in high school or as a regular transfer student.

High school students who wish to enroll in these programs should apply during their senior year to receive a guaranteed entry date one year later. Transfer students apply for sophomore year entry during the academic year prior to their intended fall semester entry at The Ranger School (spring admission is not available). For further information on The Ranger School, visit the website or refer to The Ranger School section of this catalog.

Educational Opportunity Program

Offered only to full-time students who are New York state residents, first year and transfer students who qualify, both academically and economically, may be eligible for the EOP program.

High school seniors who wish to apply for first year enrollment and EOP status at the College must file a SUNY application or The Common Application and indicate they want to be considered for EOP. In addition, they must submit a copy of the Free Application for Federal Student Aid (FAFSA), indicating ESF as a receiving institution.

In order for transfer students to participate in the program at the College, they must have been enrolled in or qualified for EOP, Higher Education Opportunity Program (HEOP), Search for Education Elevation and Knowledge (SEEK) or similar program at their prior college. Therefore, students who are applying to ESF as high school seniors through the Guaranteed Transfer option should also apply for EOP, HEOP or SEEK at their lower-division college, and must enroll in or be qualified for such a program in order to continue in EOP at ESF.

All EOP applicants must file applications for undergraduate admission and financial aid as described in those two sections of this catalog.

Deferred Admission

Students accepted to ESF who wish to defer their enrollment for one or two semesters beyond their original entry term must make this request in writing directly to the Office of Undergraduate Admissions. Students will receive written notification if their request has been approved.

Graduate Admission Policies & Requirements

- [Graduate Admissions](#) (complete, current information for prospective students)

Admission to Graduate School is conditional upon review and acceptance of an applicant's credentials by appropriate faculty members and upon the recommendation of the appropriate department chairman or program director to the Interim Associate Provost for Academic Affairs and Dean of the Graduate School.

Application Requirements

Submit securely via our online application.

- **Transcripts**
Transcripts of an earned bachelor's degree from a recognized institution with an academic record showing at least a "B" average for junior and senior years of the baccalaureate program or for the master's program
- **Application**
The graduate application
- **Scores**
Scores from the Graduate Record Examination (GRE) and for some degree programs, advanced test scores (institution code for official score reports: **2530**)
- **Recommendations**
Three letters of recommendation from individuals who can attest to your academic or professional skills. This should NOT include personal friends and family
- **Resume**
A resume or CV
- **Statement**
A statement of educational and professional goals
- **Fee**
A nonrefundable \$60(US) application fee

Students whose primary language is not English are also required to provide evidence of English language proficiency.

Applying for Admission

Faculty seek graduate students who are well prepared for rigorous study, responsive and receptive to constructive feedback, and a good fit with their programs. The most effective way for applicants to demonstrate these qualities is to communicate with faculty prior to applying and to understand the programs ESF has to offer. Therefore, individuals who are interested in applying for graduate study should contact ESF faculty to discuss degree programs and learn about specific opportunities for study and research at ESF. Faculty Web pages provide contact information and additional insights about ESF degree programs. We also encourage applicants to visit campus and meet with faculty and current graduate students.

Application Deadlines

While the following dates are particularly important for applicants wishing to be considered for fellowships, assistantships, and other forms of financial assistance, ESF will continue to accept and fully consider graduate applications beyond each of the noted deadlines:

Application Target Dates

Semester of Matriculation	Application Deadline *
Fall	January 15
Spring	November 1

*Applications completed by these deadlines by these dates will normally receive decisions by mid-March for fall matriculation and by early December for spring matriculation.

Graduate Record Exam Subject Tests

Subject tests are recommended by the following programs:

Graduate Program	Subject Test
Environmental and forest chemistry	Chemistry - recommended
Biochemistry area of study within environmental and forest chemistry	Chemistry or Biology - recommended

Transfer Credit

Credit hours appropriate to the graduate degree in which a minimum grade of B was earned from an accredited institution can be transferred to the College, but grades and grade points cannot be transferred.

Up to six credits of graduate coursework **not used to complete another degree** may be accepted toward completion of a master's or doctoral degree as approved by the steering committee.

Up to 30 credits of graduate level coursework **earned as part of a conferred master's degree** may be transferred (by petition) to a doctoral degree with approval of the steering committee.

Students may transfer no more than nine credits of credit-bearing **non-degree ESF** coursework to graduate degree programs.

All transfer credit will remain tentative until official, final transcripts are received. It is the student's responsibility to ensure that official, final transcripts are sent to and received by the College.

Part-time Study

Part-time study at the graduate level provides an excellent opportunity for working professionals to extend their educational credentials or broaden their general knowledge by enrolling for courses on a part-time basis. The M.P.S. or M.F. professional degrees are available for students who are initially matriculated on a part-time basis. Part-time students apply, matriculate and register through the same processes that all ESF graduate students complete. During any semester, students who enroll in part-time programs may register for the equivalent of full-time study, which is at least 12 credit hours. Part-time students are held to the policy for continuous registration, but not to the policy for time to degree (delimitation).

Deferred Admission

Students accepted to graduate programs at ESF who wish to defer their enrollment beyond their original entry term must make this request in writing directly to the The Graduate School.

Faculty as Students

Employees of the College who carry faculty status in accordance with SUNY ESF Faculty Bylaws and are at or above the rank of assistant professor or equivalent, may not enter into matriculated status at the College.

International Student Admission Policies & Requirements

- [International Admissions](#) (complete, current information for prospective international students)

In addition to the admission requirements that all prospective students must meet, international applicants must provide the following:

Standard	Undergraduate Admission Score (Minimum)	Graduate Admission Score (Minimum)
TOEFL (paper-based)	550	550
TOEFL (internet-based)	79	80 (with no individual component score < 17)
IELTS	Total: 6.0 (with no less than 5 in Writing)	Total: 6.0 (with no less than 5 in Writing)
Duolingo English Test (DET)	100	105
PTE Academic	53	53
STEP EIKEN	Grade pre-1	(University level) Grade 1
Syracuse University - English Language Institute (ELI)	Successful completion of ELI "Level 4"	Successful completion of ELI "Level 4"
ELS	Successful completion of Level 112	Successful completion of Level 112
Previous college-level instruction in English	Completion of at least one three-credit English course at an institution where the language of instruction is in English. ESL courses will not count toward meeting this requirement.	<ul style="list-style-type: none">• Completion of at least two years of college (academic studies, not English language instruction) at an institution where the courses were taught in English.• Successful completion of at least one semester at SUNY ESF

SAT	500 Evidence-Based Reading & Writing Score	N/A
ACT	22 Composite Score	N/A
Duolingo (DET)	(Minimum) = 100	(Minimum) = 105

Note: SUNY ESF accepts MyBest TOEFL scores for both undergraduate and graduate admissions.

1. Transcripts and international academic credentials—International applicants must provide complete translations into English of all transcripts required by the admissions application without any additions or deletions by the translators. Translations of documents by the applicant will not be accepted. Credential evaluator and translation services for academic documents may be found through the [National Association of Credential Evaluation Services \(NACES\)](#).

- **International freshman applicants** are required to demonstrate the completion of a college preparatory secondary school program by submitting academic credentials translated into English. This evaluation must be completed by an approved international credentials evaluation agency.
- **International transfer applicants** are required to submit a detailed course-by-course evaluation of all international academic credentials in English. This evaluation must be completed by an approved international credentials evaluation agency.

2. Copy of the passport should be submitted with application materials.

International Students Currently Attending an Educational Institution in the U.S.

In addition to the entrance requirements for other international students, international students who are currently enrolled at a U.S. educational institution must obtain permission (usually through a Transfer-In Form) from their current educational institution to transfer their SEVIS record to ESF. Students will also have to complete a [SUNY ESF SEVIS Transfer-In Form](#) (F-1 Students / J-1) so that ESF is aware of when your current institution will release your SEVIS record to ESF so that a new I-20 or DS-2019 can be issued for the ESF program of study. Additional information about transferring your SEVIS record to ESF is available [online](#).

I-20 Issuance for International Students

An I-20, required for the F-1 student [visa application](#), will be issued once a student has:

- 1. Been officially admitted to ESF;**
- 2. Submitted adequate financial support documentation for at least one year of expenses at ESF;**

In order to obtain an I-20 from ESF, a potential F-1 student must complete the "[FSA-4 - Financial Statement](#)" and submit credible documentary evidence that they have enough readily available funds to meet all [expenses](#) (tuition, fees, and living expenses) for the entire first year of study. (It is expected that barring unforeseen circumstances, students will have adequate funds available for each subsequent year of study from the same source or from one or more other specifically identified and reliable financial sources.)

Documentation of sufficient funding may come from any combination of dependable sources, including scholarships, assistantships, fellowships, sponsoring agencies, personal funds, or funds from a student's family. Documentation of scholarships, assistantships, and fellowships must be in the form of an official award letter from the school or sponsoring agency; documentation of personal or family funds should be on an official signed letter of support from the bank that

includes the U.S. dollar amount of support and certified bank statements which indicate that the sponsor has sufficient funds to meet a student's first-year expenses at ESF (the bank statement does not have to show the full amount of the account), or in the form of a legally binding affidavit. The [Form I-134](#), "Affidavit of Support," can be used to document support being provided by a U.S. citizen or U.S. legal permanent resident. Government-sponsored applicants should submit a certified copy of the award letter that includes the U.S. dollar amount of the award per year, the duration of the award and a list of expenses covered by the award.

1. Indicate your intention to enroll at ESF through your ESF Applicant Portal by submitting the required admissions deposit.
2. Submitted the New Undergraduate International Student Information Form.
3. Submitted a passport copy.

Once all of the above materials have been received, an I-20 will be issued and mailed to the prospective international student by the Office of International Education.

Health Insurance Requirement

ESF students who are not U.S. citizens or permanent residents are required by SUNY policies to maintain [comprehensive health insurance with medical evacuation and repatriation coverage](#) for themselves (and their dependents in the United States) for the duration of their ESF program of study. International students are automatically enrolled in the SUNY Health Insurance Plan unless proof of comparable health insurance is provided to the Bursar's Office within 30 days of the start of each semester.

STUDENT FINANCIAL INFORMATION

NOTE: All information regarding college expenses and financial aid is subject to change without notice by official action.

College Expenses

- www.esf.edu/tuition-aid/bursar/

The ESF tuition and college fee structure is set by the State University of New York Board of Trustees and generally covers the costs associated with instruction and the use of facilities and services at the College.

Tuition Schedule

- www.esf.edu/tuition-aid/bursar/costs.php

Residency

For purposes of tuition, “residence” refers to the principal or permanent home to which the student returns. Students who believe they qualify as New York residents may apply for a change in residency after they are accepted by ESF. Application forms are available in the Office of Business Affairs in 101 Bray Hall.

Tuition Schedule as of the beginning of the 2024-2025 Academic Year

NOTE: Tuition is subject to change at any time by official action.

Status	New York State Resident Students	Out-of-State Students
Undergraduate Full-time*	\$3, 535 per semester (maximum total tuition for 12 credit hours or more)	\$10, 015 per semester (maximum total tuition for 12 credit hours or more)
Undergraduate Part-time	\$295/credit hour	\$835/credit hour
Graduate Full-time	\$5,655 per semester (maximum total tuition for 12 credit hours or more)	\$13,345 per semester (maximum total tuition for 12 credit hours or more)
Graduate Part-time	\$471 per credit hour	\$1112 per credit hour

Additional Expenses

Fees and Other Expenses

- www.esf.edu/tuition-aid/bursar/

Several mandatory, optional and/or program-specific fees add to the cost of attendance. In addition to the costs of books and supplies, there may be expenses associated with a specific degree program, including summer field experience costs, study abroad expenses, Syracuse University course or lab fees, etc. Personal expenses include clothing, transportation, recreation, etc. Details are found on the bursar website

Housing and Meal Plans

- www.esf.edu/student-affairs/living-dining/
- www.esf.edu/student-affairs/living-dining/mealplans/

Most entering first-year (freshmen) students are required to live in college housing and have a minimum meal plan that includes both Syracuse University Dining Services and ESF's Trailhead Cafe. Students are not required to live on campus after their first year. Entering transfer students and continuing ESF students may choose to live on campus or off campus, with housing and meal costs charged accordingly. Visit the ESF housing website for details.

Terms of Payment

- www.esf.edu/tuition-aid/bursar/billing.php

New undergraduate students pay an advance payment deposit and must pay ensuing bills according to a payment schedule set by the college. Information on the deposit, payment schedule, late fees, refunds and all other topics related to student financial obligation are available on the Bursar's website.

Financial Aid

- www.esf.edu/tuition-aid/financialaid/
- www.esf.edu/consumer/ (student consumer information, including student financial assistance resources)

The College offers these basic forms of student financial assistance: scholarships or grants; part-time employment; educational loans; assistantships, tuition scholarships, and fellowships for graduate students; a deferred tuition payment plan; and sources of non-need loans to students and parents.

Federal and state financial aid programs are for United States citizens, permanent residents or other eligible non-citizens. International students will be considered for academic merit-based scholarships, assistantships and fellowships, but are not eligible for need-based student financial assistance. Aid programs are coordinated to supplement parental support, summer work, savings, and assistance from other sources. The sources of funds for financial assistance programs, the guidelines for determining the recipients, the procedures for applying, and the method of disbursement of funds vary from one program to another. This information is presented in detail on the ESF Financial Aid Web Page.

Financial aid is awarded primarily on the basis of financial need. Some scholarships and fellowships, however, are based on other criteria, such as academic achievement. Assistantships, tuition scholarships and fellowships for graduate students are awarded based upon academic achievement.

In order for students to receive aid, they must be making satisfactory academic progress toward a degree. Please refer to the appropriate sections under ESF College Aid, Federal Student Aid, and New York State Aid later in this chapter for satisfactory academic progress requirements.

In addition, students are only eligible to receive most types of aid for courses that are required for degree completion. Students enrolled in credits beyond the number required for the degree or enrolled in courses that are not applicable to a degree requirement will have financial aid adjusted accordingly.

Financial aid advisors are aware of the many problems associated with financing higher education and meeting living expenses for both undergraduate and graduate students and are available to discuss individual problems. All students are encouraged to apply for financial aid.

Applying For and Receiving Aid

How to Apply

Students interested in receiving financial assistance, with the exception of graduate assistantships, graduate tuition scholarships, graduate fellowships, and merit-based scholarships, must complete the [Free Application for Federal Student Aid \(FAFSA\)](#). It is highly recommended that all students complete the FAFSA as soon as possible each year. Timely completion of the FAFSA, which is available starting October 1 each year, will ensure that aid eligibility is maximized and any problems can be resolved without delaying the arrival of funds. In order to receive priority consideration and maintain eligibility for need-based grants and scholarships, a processed FAFSA must be received by the Financial Aid Office no later than March 1 each year. The school code for SUNY ESF is 002851.

Paper versions of the FAFSA are available for download at <https://studentaid.gov/apply-for-aid/fafsa/filling-out>.

Students completing the FAFSA online (recommended) will need an FSA ID in order to access the application and provide electronic signatures. Parents of dependent students will also need an FSA ID in order to sign the student's FAFSA. New or forgotten FSA IDs can be requested at <https://studentaid.gov/fsa-id/sign-in/landing>.

While completing the FAFSA, your consent will automatically import your tax data directly from the IRS into your application.. Students and parent contributors should only enter tax data manually if the import process is not successful. Tax information reported should be from the "prior-prior year" (ex. 2023 tax year data when applying for the 2025-2026 school year, 2024 tax year data when applying for the 2026-2027 school year, etc.).

Students interested in receiving financial assistance for the summer must complete the separate SUNY ESF Summer Aid Application.

Application	Deadlines
Free Application for Federal Student Aid (FAFSA)	October 1 - Application Available March 1 - Priority Deadline Last Day of Enrollment Each Year - Final Deadline

	June 30 - Official Federal Application Close
New York State Grants and Scholarships	October 1 - Application Available
	May 1 (Following Year) - Final Deadline

New York State Tuition Assistance Program (TAP)

New York State residents are encouraged to apply for state grants and scholarships, including the Tuition Assistance Program (TAP), Excelsior Scholarship, STEM Incentive Grant, and others. The Express TAP Application (also known as the Application for Payment of New York State Grants and Scholarships) is required annually for determination of TAP Grant eligibility. It must also be completed for other state awards, which require separate applications, to be awarded and paid. Students who are New York State residents and list a New York State school while completing the FAFSA will be given the opportunity to complete an online TAP Application by clicking on the link which appears on the FAFSA Submission Confirmation Page. The online application may also be accessed at <https://www.tap.hesc.ny.gov/totw/>.

Eligibility for TAP and other New York State grants and scholarships is determined by the New York State [Higher Education Services Corporation](#) (HESC). Students interested in applying for NY grants and scholarships other than TAP should be sure to complete each separate application in addition to the TAP application.

The SUNY ESF School Code for state aid applications is 0950. If searching for ESF use "SUC En" as the criteria. Students will be asked to provide a college issued ID number when completing the applications. If known at the time of application, students should enter their ESF Banner ID, which begins with "F". If not known, this step can be skipped with no ID entered.

Graduate Student Assistantships

Assistantships and tuition scholarships for graduate students are not awarded by the Financial Aid Office. Students interested in these forms of financial assistance should contact the Graduate School.

Verification of Information

All students who request financial assistance may be required to submit information about their and/or their family's personal financial situation prior to aid disbursement. The College may request copies of parents' and/or students' federal tax transcripts, along with other statements which will be used to verify other sources of income, family size, number of dependents in college, and other pertinent information.

Requests for verification information are authorized by the FAFSA signature process. **Failure to comply with a request to verify pertinent information will result in the cancellation of any aid offered, and the possibility of legal action being taken by the U.S. Department of Education.**

Summer Financial Aid

Matriculated students planning to take courses over the summer at SUNY ESF may be eligible for limited amounts and types of financial aid through the following programs:

- Federal Direct Student and Parent Loans
- Private Student Loans
- Federal Pell Grants

Summer Planning

Students are highly encouraged to plan summer expenses prior to the end of the spring semester each year. Some students may have remaining unused aid available at that time, but no longer have that eligibility once the semester has ended. Only students meeting the minimum enrollment requirements can be considered for aid once the spring semester has ended.

Academic Year Structure

The summer term at SUNY ESF is the trailer to the academic year. This means that federal loan amounts will be limited to funds remaining within the annual limits for each program that were not used during the preceding fall and spring semesters. Summer courses are offered in what are called modules, or segments which do not span the entire length of the full summer term.

Year Round Pell Grants

Special regulations now allow for Pell-eligible students to receive more than 100% of a scheduled Pell Grant award for a single year if certain criteria have been met. For summer enrollment, these awards can be from either the academic year before or after the summer term, known as a "cross-over" period. When possible, the academic year used for the funds should be based on what is most beneficial for the student. This determination will be made by the Office of Financial Aid based on various criteria and considerations. Please note that a valid FAFSA is required for the school year used. If a student has only completed a FAFSA for one year, only that year can be considered for possible funding.

Enrollment Requirements

In order to potentially qualify for summer aid, students must meet minimum degree-applicable enrollment requirements as follows:

Loan/Grant	Enrollment
Federal Direct Student and Parent Loans	Half-time (typically 6 credits)
Private Student Loans	Determined by Lender
Federal Pell Grant (0-150% useage*)	Less-than-half-time (1-5 credits)

*One term of Pell Grant eligibility at full-time enrollment uses 50% of a scheduled award. At lower enrollment levels that percentage is pro-rated: half-time enrollment uses 25% and so forth.

Application Process

Students seeking financial aid for summer enrollment should complete a [Summer Financial Aid Application](#) (available in the Financial Aid Office in Bray Hall) by the listed deadline and must have a valid [FAFSA \(Free Application for Federal Student Aid\)](#) on file. Please do not e-mail any personal information. Applications should be delivered in-person, mailed, faxed, or uploaded with the

document exchange function available from the financial aid section of the MyESF portal (student accounts only).

Notification of Eligibility

Students will be notified of eligibility for federal aid sources with an amended financial aid package. Notifications of amendments are sent electronically to campus e-mail addresses and are viewable through the [MyESF student portal](#). Students who are not eligible for federal aid will be notified either electronically or in writing. Students seeking funds from alternative student loans are responsible for working directly with the lender they have chosen.

Disbursement of Funds

Aid funds will only be disbursed to student accounts once the student has started enough courses in the summer to reach the minimum enrollment requirements. Note that summer aid funds may not be disbursed until after a bill is due in many cases.

Withdrawals and Return of Funds

Students who fail to begin each of their scheduled classes during the full summer term may be considered to have withdrawn from the term and could be required to return funds already received. This can occur in the following scenarios:

- After starting summer classes, a student completely ceases attendance prior to the end of those classes.
- Example: a student starts enrollment in two 3-credit courses in the first summer module, but stops attending those classes prior to the scheduled end date.
- After starting and finishing some summer courses, a student drops a later scheduled course while not currently attending any classes.
- Example: a student plans to take two 3-credit courses in the first summer module and one 3-credit course in the last summer module, with a break between the modules. The student completes the first two courses, and then drops the third course during the break.

In order to avoid complications in these scenarios, students are highly encouraged to do the following:

- Make summer course changes only while still attending classes in the first module of planned attendance.
- Avoid scheduling classes if there is any uncertainty that the student will actually enroll in those classes.

Study Abroad Financial Aid

Varying types and amounts of financial aid may be available to students who wish to travel abroad as part of their degree program. All students seeking financial aid for this purpose must be taking courses that specifically meet a degree requirement. Enrollment level for aid eligibility will be based only on the courses which meet this condition. Before any aid eligibility can be considered, students must have submitted an approved SUNY ESF Study Abroad Request Form, a fully completed Study Abroad Data Form, and additional paperwork as indicated in the following sections. Financial aid is only available for abroad study which is during an existing term at SUNY ESF. Students seeking financial aid must also meet all existing eligibility requirements for each individual source of funding.

SUNY ESF Students Participating in a SUNY Study Abroad Program

Students studying abroad through a program at another SUNY school may be eligible for the following types of financial aid:

- Federal Aid
- State Aid
- Institutional Aid

To be considered for financial aid, students in this category must submit the following:

- Approved [Study Abroad Request Form](#)
- Completed [Study Abroad Data Form](#)
- Completed [Study Abroad Consortium Agreement Form](#)

SUNY ESF Students Participating in a Non-SUNY Study Abroad Program

Students studying abroad through a program at a non-SUNY school which participates in the Federal Student Aid Programs may be eligible for the following types of financial aid:

- Federal Aid
- State Aid (Only if the host school is located within New York State)
- Institutional Aid

To be considered for financial aid, students in this category must submit the following:

- Approved [Study Abroad Request Form](#)
- Completed [Study Abroad Data Form](#)
- Completed [Study Abroad Consortium Agreement Form](#)
- Copy of the tuition bill from the New York State school, if applicable

SUNY ESF Students Participating in a Foreign School or Outside Organization Study Abroad Program

Students studying abroad through a program at a foreign school which does not participate in the Federal Student Aid Programs or through an outside organization acting on behalf of such an institution may be eligible for the following types of financial aid:

- Federal Aid
- Institutional Aid

To be considered for financial aid, students in this category must submit the following:

- Approved [Study Abroad Request Form](#)
- Completed [Study Abroad Data Form](#)
- Completed [Study Abroad Consortium Agreement Form](#)

SUNY ESF Students Participating in a Domestic Off-Campus Program

Students studying off-campus within the United States through a school which participates in the Federal Student Aid Programs may be eligible for the following types of financial aid:

- Federal Aid
- State Aid (Only if the host school is located within New York State)
- Institutional Aid

To be considered for financial aid, students in this category must submit the following:

- Approved [Study Abroad Request Form](#)
- Completed [Study Abroad Data Form](#)
- Completed [Study Abroad Consortium Agreement Form](#)
- Copy of the tuition bill from the New York State school, if applicable

Disbursement of Financial Aid Funds

All financial aid funds for study abroad will be scheduled for disbursement to SUNY ESF ten days prior to the students departure. Once disbursed, funds are processed through the Bursars Office. With the exception of tuition charges to any SUNY institution, all aid funds will be disbursed directly to the student or to the parent (if from a Parents Loan) once they are available through the Bursars Office. SUNY tuition charges will be collected by SUNY ESF and transferred to the host school. No other funds will be disbursed or paid to the host school or organization. **It is the students responsibility to make all necessary payment arrangements as necessary.**

Academic Credit Earned

All students studying abroad must ensure that an official transcript of all courses is submitted to SUNY ESF upon completion of the program. Students who do not submit an official transcript or who do not fully complete the approved program will be subject to the College's Withdrawal, Refund, and Satisfactory Academic Progress policies. This could result in a loss of eligibility for funds already received or a loss of eligibility for future financial aid.

Satisfactory Academic Progress

In order for students to receive federal, state, and institutional aid, they must be making "satisfactory academic progress" toward a degree. The rules for satisfactory academic process depend upon the type of aid involved **ESF College Aid, Federal Aid, and New York State Aid.**

ESF College Aid

Full-time undergraduate students receiving any of the following ESF awards are eligible to have their awards renewed in future years if they maintain an overall Grade Point Average (GPA) and enrollment level as indicated and complete the FAFSA by the February 1st priority deadline each year:

- ESF Transfer Scholarship - 2.50 GPA and Half-Time Enrollment (6 credits or more)
- ESF College Aid Grant (ESF College Scholarship) - 2.50 GPA and Half-Time Enrollment (6 credits or more)
- ESF Asimov Scholarship/ESF 1911 Scholarship - 2.50 GPA and Half-Time Enrollment (6 credits or more)
- ESF Renewal Grant - 2.50 GPA and Half-Time Enrollment (6 credits or more)
- ESF Presidential Scholarship - 3.00 GPA and Full-Time Enrollment (12 credits or more)
- ESF in the High School Scholarship - 3.00 GPA and Full-Time Enrollment (12 credits or more)
- ESF National Scholarship - 3.00 GPA and Full-Time Enrollment (12 credits or more). Must also be charged non-resident tuition rate.
- ESF Tuition Match Scholarship - 2.50 GPA and Full-Time Enrollment (12 credits or more). Must also be charged non-resident tuition rate.
- ESF Mighty Oaks Scholarship - 2.50 GPA and Full-Time Enrollment (12 credits or more). Must also be charged non-resident tuition rate.
- ESF Phi Theta Kappa Scholarship - 3.00 GPA and Full-Time Enrollment (12 credits or more)
- ESF Centennial Hall Scholarship - 2.50 GPA (student must also reside in Centennial Hall to remain eligible for this scholarship) and Half-Time Enrollment (6 credits or more)
- ESF OCC/ECC Transfer Scholarship - 3.00 GPA and Full-Time Enrollment (12 credits or more)
- ESF Legacy Scholarship/Eustace B. Nifkin Scholarship - 2.50 GPA and Full-Time Enrollment (12 credits or more)

- ESF College Foundation Endowed Awards (Individually Named) - 2.50 GPA (unless specified otherwise for specific awards) and Half-Time Enrollment (6 credits or more)

Federal Student Aid

Undergraduate and graduate students must meet specified criteria in order to be eligible for Title IV Federal Student Assistance, which includes Federal Pell Grants, Federal Supplemental Educational Opportunity Grants, Federal Student Loans, the Federal College Work-Study Program, and the Federal Parent Loan for Undergraduate Students. The criteria that students must meet to be eligible for Title IV student aid are the same criteria all ESF students must adhere to in terms of institutional academic policies and, specifically, academic progress requirements.

The evaluation criteria are the following:

1. appropriate cumulative and term grade point averages to ensure satisfactory academic progress;
2. receipt of a degree within the prescribed time limit for the student's program;
3. successful accumulation of credits toward a degree.

1. Cumulative Grade Point Average

Undergraduate students enrolled in an approved degree program at the Syracuse Location

In order to remain eligible for Title IV Federal Student Assistance, a student must meet the cumulative and semester grade point average requirements of the Academic Performance Policy. A student will no longer be eligible for federal aid if the student's cumulative grade point average and most recent term grade point average are below 2.0 or when the cumulative grade point average alone is less than the required limits in the chart below.

Total Hours applied Toward Degree (credit earned while matriculated at ESF, including SU courses)	Minimum Cumulative Grade Point Average (includes only courses taken while matriculated at ESF)
0-30	1.700
31-60	1.850
61-120 or more	2.000

Graduate students enrolled in an approved degree program at the Syracuse location

In order to remain eligible for Title IV Federal Student Assistance, a student must meet the minimum cumulative grade point average of 3.000 as indicated in the Academic Performance Policy.

Students enrolled in an approved degree program at the Wanakena location

In order to remain eligible for Title IV Federal Student Assistance, a student must meet the minimum cumulative grade point average of 2.000.

2. Maximum Timeframe

Students receiving federal student aid funds must make steady academic progress toward their degrees. While most students pursue their degrees on a full-time basis, others do not. In order

to allow for maximum flexibility to complete a degree, federal regulations state that students' maximum timeframe to be eligible for federal aid shall not exceed 150 percent of the published length of time it takes to complete that degree on a full-time basis.

The following chart lists the maximum number of credit hours a student may take and still receive federal student aid. These figures are based on 150 percent of the credit hours required to complete each of the degrees offered by the College—regardless of the time it takes to complete that degree.

For any program not specifically listed, the maximum timeframe is 150% of the number of credits required to obtain the degree.

Standard of Satisfactory Academic Progress for Purpose of Determining Eligibility for Federal Aid

Degree	Credit Hours Required	Maximum Hours Allowed
Associate in Applied Science		
Environmental and Natural Resources Conservation	64	96
Forest Technology	64	96
Land Surveying Technology	64	96
Bachelor of Science	125	187
Aquatic and Fisheries Science	126	189
Bioprocess Engineering	128	192
Biotechnology	123	184
Chemistry	121	181
Conservation Biology	126	183
Construction Management	122	186
Environmental Biology	126	189
Environmental Education and Interpretation	126	189
Environmental Health	126	189
Environmental Resources Engineering	128	192
Environmental Science	126	189
Environmental Studies	121-124	186
Forest Ecosystems Science	124	186

Forest Health	126	189
Forest Resources Management	125	187
Natural Resources Management	122	183
Paper Engineering	128	192
Paper Science	124	186
Sustainable Energy Management	120	180
Wildlife Science	126	189
Bachelor of Landscape Architecture	150	225
Bachelor of Landscape Architecture (Effective Fall 2016)	141	211
Bachelor of Landscape Architecture (Effective Fall 2025)	126	189
Master of Forestry	37	55
Master of Landscape Architecture	70	105
Master of Professional Studies (unless otherwise noted)	30	45
Applied Ecology	36	54
Chemistry	33	49
Environmental and Forest Biology	42	63
Plant Biotechnology	36	54
Master of Science (unless otherwise noted)	30	45
Environmental Studies	37	55
Doctor of Philosophy	60	90

3. Pace of Progression

Federal student aid (Title IV) eligibility is also related to the successful completion of credit hours completed versus credit hours attempted. This component of eligibility is referred to as Pace of Progression or Pursuit of Program. Pursuit of Program is defined as: the cumulative number of credit hours completed divided by the cumulative number of credit hours attempted. This equation is tied back into the overall credits needed to be earned to graduate for any of our degrees. Generally, the cumulative number of credits a student must complete to remain fully eligible is 67 percent (.67) of the attempted credits. Percentages are rounded up for this calculation. For example, a student completing courses at a rate of 66.5 to 66.9 percent will be considered to be completing courses at a 67 percent rate. Students receiving federal student aid from Title IV programs must be making progress towards their degree at the cumulative rates of completion as follows:

- 50% cumulative rate of completion for undergraduate first-year students.
- 67% cumulative rate of completion for all other undergraduate class years.
- 67% cumulative rate of completion for all graduate class years.

An example of meeting the requirement is:

Cumulative Credits Attempted = 15
Cumulative Credits Completed = 12
Pace of Progression = 12 divided by 15 = .80

The completed credits exceed .67 and the student is eligible for continuing to receive Title IV aid by successfully meeting the Pace of Progression requirement.

An example of not meeting the requirement is:

Cumulative Credits Attempted = 15
Cumulative Credits Completed = 6
Pace of Progression = 6 divided by 15 = .40

The credits completed fall below the minimum requirements and therefore the student is not meeting the Pace of Progression requirement.

Treatment of Incomplete Grades, Withdrawals, Repeated Courses, Remedial Courses, Change of Major, and Transfer Credits

1. Incomplete grades

Incomplete grades do count as attempted credits, but grade point average will only be affected once the incomplete status has been resolved and a final grade assigned. The assigned grade and the attempted/completed credits will be included in the Satisfactory Academic Progress calculations during the next regular review.

Resolution of incomplete grades follows the "Incomplete and Missing Grades" College policy as follows:

Incomplete and missing grades

A temporary grade of I may be assigned by an instructor only when the student has nearly completed the course but because of significant circumstances beyond the student's control the work is not completed. Grades of I should be resolved within one academic year. If the

incomplete is not resolved within one year, it will be changed to a grade of I/F or I/U, depending on the grading basis for the course. No degree will be conferred until all grades of I have been resolved.

2. Withdrawals

Withdrawals from courses after the deadline to drop a course each semester (end of the 4th week) will be included in Satisfactory Academic Progress reviews based on the grades assigned according to the College's "Withdrawal from ESF" policy. All courses dropped after the deadline to drop a course (end of the 4th week) will be considered attempted but not completed. Courses dropped by the deadline to drop a course will not be included in the Satisfactory Academic Progress reviews.

Withdrawal from ESF

Students who withdraw from matriculation at the College on or before the deadline to drop a class for a semester will have their records marked: "Withdrew on (date)." Courses will appear for that semester with the grade of W.

Students who withdraw after the **end of the 4th week of the semester**, but on or before the last class day before the final examination period, will have either WP (withdraw passing) or WF (withdraw failing) listed after each uncompleted course. Students who do not withdraw on or before the last class day will have a grade on a scale of A-F, an I (incomplete), or I/F (unresolved incomplete) assigned by the instructor for each registered course.

Students who wish to withdraw from ESF should schedule a meeting to review the withdrawal process and complete an exit interview in the Office of Student Affairs.

Withdrawal from Individual Courses

Students may drop individual courses up until the **last day to add** as set by the Registrar in the ESF Academic Calendar using an **add/drop form**. Dropped courses during this period will be completely removed from the transcript when dropped on or before this deadline.

Deadlines and actions to be taken after the last day to add deadline are:

- **Last day to add – Week 4:** After the **last day to add** (as per the academic calendar), students may drop a course without record of registration, until the end of the 4th week of classes.
- **Weeks 5-9:** A student who withdraws from a course after the last day of the **4th week and by the last day of the 9th week** will receive a W (Withdraw) grade on his or her permanent transcript, and the student will remain on the course roster. The W grade will not affect the GPA, and will not be replaced when the course is repeated.
- **Weeks 10-14:** A student who withdraws from a course after the last day of the **9th week and by the last day of the 14th week** will receive a W or a WF (withdraw failing) on his or her permanent transcript, and the student will remain on the course roster. The WF grade will not count in the student's GPA. W and WF grades are not replaceable. The W (when assigned after the last day of the 9th week) and WF grade will be assigned by the instructor at the end of the semester.

Precise deadline dates noting the official end of weeks above shall be listed on the ESF Academic Calendar found on the Registrar's webpage.

3. Repeated Courses

Repeated courses will be included in Satisfactory Academic Progress reviews according to the College's "Repeating Courses" policy:

Repeating Courses

Undergraduate students may repeat any course previously taken either to earn a higher grade or because of a previous failure. Courses taken at ESF or Syracuse University that contribute to the GPA may be repeated. Ability to repeat a course may be limited by space availability, providing priority for first time registrants.

Repeated courses will be reported as follows: a) the original and the repeated grade(s) appear on the transcript; b) only the higher (or highest) grade is included in the calculation of the cumulative grade point average. The highest grade will be marked with an "I" for included to show that it is included in the cumulative GPA. Any other grades will be marked with an "E" for excluded to show that it is excluded from the cumulative GPA.

When a student earns the same grade in a repeated course a) the grade is calculated once in the cumulative grade point average and b) the credits and quality points are applied to the most recent term or semester in which the grade was earned. Credit hours for the repeated course may be counted only once toward meeting graduation requirements.

For state-based financial aid, repeated courses in which students have received a passing grade will not count toward full time status. Students retaking courses may find their financial aid reduced if they fall below 12 credits when the retaken courses are not included. Students should contact the Financial Aid Office to determine the impact of retaking courses on their financial aid. Students receiving Federal Aid may repeat a previously passed course one time and still receive aid. Students may receive aid for previously failed courses that are repeated more than once. All repeated courses count as attempted credits for the purposes of measuring Satisfactory Academic Progress.

4. Remedial Courses

Eligible remedial courses will be included in the Satisfactory Progress review in all categories.

5. Change of Major

If a student changes major, courses previously taken which do not apply to the new major will not be considered as part of the Satisfactory Academic Progress Review.

6. Transfer Credits

For the purposes of Satisfactory Academic Progress reviews, all transfer credits that are accepted as meeting a degree requirement will be counted as both attempted and completed credit hours.

Title IV Aid: Satisfactory Academic Progress Review Process

Students receiving Federal Title IV aid will be reviewed for Satisfactory Academic Progress by the College at the end of each term of enrollment, including summer terms, in order to comply with our responsibility with the regulations. This review will monitor a student's status in each of the three evaluation criteria. Based on this review, each student will be determined to be in one of four eligibility categories as noted below. Students will be notified of any change in status which affects eligibility for Title IV aid.

1. Eligible - meeting Satisfactory Academic Progress Requirements and eligible for Title IV aid.
2. Financial Aid Warning - not meeting Satisfactory Academic Progress Requirements at the end of the previous term, but still eligible for Title IV aid.
3. Ineligible - Not meeting Satisfactory Academic Progress Requirements and not eligible for Title IV aid.
4. Financial Aid Probation - Not meeting Satisfactory Academic Progress Requirements but eligible for Title IV aid based on an approved appeal and an approved academic plan, if deemed necessary through the appeal process.

Eligible

Students will be determined to be in the eligible category when meeting the calculated Pace of Progression, Maximum Timeframe, and Grade Point Average requirements or when previously on Financial Aid Probation and currently working under and meeting all conditions of an approved academic plan.

Financial Aid Warning

Eligible students who are not meeting any of the Satisfactory Academic Progress Requirements at the end of a term will automatically be placed in a status of Financial Aid Warning. Students placed in this status will remain eligible for one additional semester of Title IV aid.

Ineligible

Students already in a status of Financial Aid Warning will be placed in the ineligible category if any of the following conditions are met at the time of review:

- The student is not meeting the Pace of Progression requirements.
- It has been determined that the student is no longer able to complete the degree requirements within the maximum timeframe. Note that this is not the point at which the student has attempted the maximum allowed credit hours.
- The student is not meeting the Grade Point Average Requirements.

Financial Aid Probation

Students in the Ineligible category may appeal that status based on extenuating circumstances such as the death of a relative, an injury or illness of the student, or other special circumstances. Appeals must be submitted in writing to the Director of Financial Aid and must include the following:

- Why the student failed to make progress toward the degree
- What has changed that will allow the student to make progress
- Documentation supporting the information included in the appeal. Such documentation could include, but is not limited to, communication from doctors, counselors, or other service providers, confirmation of use of academic support services, medical records, signed statements from third parties knowledgeable of the situation, etc.

If an appeal is approved, the student will be placed on Financial Aid Probation status and will regain eligibility for Title IV aid. Students on Financial Aid Probation may receive Title IV aid for one semester if it is determined that the student should be able to meet all Satisfactory Academic Progress requirements by the end of that semester. If it is determined that the student will not be able to meet all Satisfactory Academic Progress requirements by the end of one semester, an academic plan can be developed to allow for additional semesters of eligibility as indicated in that plan. Students without an approved academic plan who do not meet all Satisfactory Academic Progress requirements after one semester of Financial Aid Probation will be again placed in the

Ineligible category. Additional appeals are allowed as long as the circumstances are not exactly the same as those that were used for a previous appeal.

Academic Plan

Students in Financial Aid Probation status who will not meet all Satisfactory Academic Progress requirements within one semester may regain Title IV aid eligibility by developing and following a specific academic plan. The need for an academic plan will be determined during the appeal process. Students in need of an academic plan will need to submit a plan proposal to the Financial Aid Office which specifies the following:

- The specific date or scheduled time when the plan will end and the student should be meeting all Satisfactory Academic Progress requirements.
- The cumulative GPA which must be reached or maintained each semester such that the cumulative GPA will be meeting the minimum progress requirements when the plan ends.
- Any changes made to the maximum number of credits which can be attempted.
- The percentage of attempted credits which must be successfully completed each semester such that the Pace of Progression will be meeting the minimum progress requirements (or the new requirements established in the plan) when the plan ends.
- Other requirements deemed necessary which are related to the circumstances of the student's successful appeal.

Students who are successfully following all conditions of an approved Academic Plan will be considered eligible for Title IV aid.

Title IV Aid : Degree Applicable Courses and Repeated Courses

Degree Applicable Courses : Students may only receive federal aid for courses which are required for degree completion. Students enrolled in credits beyond the number required for the degree or enrolled in courses that are not applicable to a degree requirement will have financial aid adjusted accordingly.

Repeated Courses : Students may repeat a previously passed course one time and still receive aid. Students may receive aid for previously failed courses that are repeated more than once. All repeated courses count as attempted credits for the purposes of measuring Satisfactory Academic Progress.

New York State Aid

All students who are awarded financial assistance will be required to maintain satisfactory academic progress each semester in order to keep their awards. Academic progress standards for all awards provided by New York are listed below. Recipients of a New York state award must adhere to the following state requirements:

- Academic Progress: Students must meet the minimum grade point average standards listed in the following charts to be eligible for an award the next semester.
- Program Pursuit: Students must meet the minimum number of credit hours listed in the following chart each semester based on a full-time course load of 12 credit hours.

Waivers for New York State Awards

Students who fall below the credit or grade point average requirements listed on the following charts may apply for a waiver to continue their eligibility for financial aid. Students are allowed only one waiver during undergraduate work and only one waiver during graduate work. A waiver

will be granted only after the student and College officials agree that a waiver is in the best interest of the student. The waiver is *not* automatic. The waiver must be filed within the academic period it should cover. Requests are made through the director of Financial Aid and Scholarships.

Waivers for the cumulative grade point average requirement may be granted only when failure to meet this requirement is due to:

- the death of a relative of the student;
- the personal injury or illness of the student;
- other extenuating circumstances.

Requests for a waiver are made through the director of Financial Aid and Scholarships.

Standard of Satisfactory Academic Progress for Purpose of Determining Eligibility for New York State Student Aid

The following charts list the credit hours a student must complete and the grade point average a student must maintain to receive the award payment.

For students pursuing an associate degree program at ESF:

Payment	Credit Hours	Grade Point Average
#1	0	.000
#2	6	1.300
#3	15	1.500
#4	27	1.800
#5	39	2.000
#6	51	2.000

Noncredit remedial instruction can be counted toward a full-time academic load as set forth in 145-2.1 of the Commissioner's Regulations. The number of credits in this chart refers to work completed toward the degree.

For students pursuing a bachelor's degree program at ESF:

Payment	Credit Hours	Grade Point Average
#1	0	.000
#2	6	1.500
#3	15	1.800
#4	27	1.800
#5	39	2.000
#6	51	2.000

#7	66	2.000
#8	81	2.000
#9	96	2.000
#10	111	2.000

Noncredit remedial instruction can be counted toward a full-time academic load as set forth in 145-2.1 of the Commissioner's Regulations. The number of credits in this chart refers to work completed toward the degree.

For students pursuing any graduate degree program at ESF:

Payment	Credit Hours	Grade Point Average
#1	0	.000
#2	6	2.000
#3	12	2.500
#4	21	2.750
#5	30	3.000
#6	45	3.000
#7	60	3.000
#8	75	3.000

Standard of Pursuit of Program for Purpose of Determining Eligibility for New York State Student Aid

The following chart lists the minimum number of credit hours a Bachelor's degree student must complete each semester.

Number of Payments	Must Receive a Grade For
Semester	
1,2	50% of minimum full-time requirement (6 credit hours on a semester calendar)
3,4	75% (9 credit hours)
5 or More	100% (12 credit hours)

New York State Aid : Degree Applicable Courses and Repeated Courses

Degree Applicable Courses : Students may only receive NY State aid for courses which are required for degree completion. Students enrolled in credits beyond the number required for the degree or enrolled in courses that are not applicable to a degree requirement will have financial aid adjusted accordingly. Students with remaining degree requirements less than 12 credits (typical full-time enrollment) may, in the final term of the degree program only, enroll in additional non-required credits to maintain full-time enrollment.

Repeated Courses : A student can repeat a course and have the course count as part of the minimum full-time or part-time course load for NY State financial aid purposes when the student did not previously earn credit for the course.

Types of Available Awards

NOTE: In the tables below, the term “Full-Time Undergraduate Student” in this chart means one taking at least 12 credit hours per semester in a degree/ certificate program; “Three-Quarter-Time Undergraduate Student” means one taking at least 9 credit hours per semester in a degree/ certificate program; “Half-Time Undergraduate Student” means one taking at least 6 credit hours per semester in a degree/certificate program. Graduate students not holding an assistantship are considered full-time if registered for 12 credit hours each semester. Graduate students holding an assistantship and/or tuition scholarship are full-time if registered for 9 credit hours each semester. This information is accurate as of 09/1/2024.

ESF Scholarships and Grants

Scholarship Program	Eligibility	Amount	Where to Apply
ESF Presidential Scholarships	Awarded to outstanding full-time students from NY State. Recipients are selected based on academic records, recommendations, and academic program requirements.	Up to \$3,000 per year. Renewable with 3.0 cumulative GPA. Maximum award amounts may vary from year to year and may be impacted by other institutional aid awards.	All first-year and transfer applications submitted to ESF by February 1 will be reviewed for possible selection.
ESF National Scholarships	Awarded to outstanding full-time students from outside NY State. Recipients are selected based on academic records, recommendations, and academic	Up to \$8,000 per year. Renewable with 3.0 cumulative GPA. Maximum award amounts may vary from year to year and may be impacted by other	All first-year and transfer applications submitted by February 1 will be reviewed for possible selection.

	program requirements.	institutional aid awards.	
ESF Mighty Oaks Scholarships	Awarded to outstanding students from outside NY State. Recipients are selected based on academic records, recommendations, and academic program requirements.	Up to \$3,000 per year. Renewable. Maximum award amounts may vary from year to year and may be impacted by other institutional aid awards.	All first-year applications submitted by February 1 will be reviewed for possible selection.
ESF Asimov and ESF 1911 Scholarships	Awarded to students from NY State based on total family income.	Up to \$3,000 per year. Renewable. Maximum award amounts may vary from year to year and may be impacted by other institutional awards.	All first-year and transfer applications submitted by February 1 will be reviewed for possible selection.
ESF College Aid Grant	Awarded to incoming first-year students based on financial need.	Up to \$3,000 per year. Maximum award amounts may vary from year to year and may be impacted by other institutional aid awards. Renewable with a 2.5 cumulative GPA and FAFSA received annually by the priority deadline.	Student must complete the FAFSA
ESF Transfer Grant	Awarded to incoming transfer students based on financial need.	Up to \$3,000 per year. Maximum award amounts may vary from year to year and may be impacted by other institutional aid availability. Renewable with a 2.5 cumulative GPA and FAFSA received annually by the priority deadline.	Student must complete the FAFSA

ESF Renewal Grant	Awarded to existing grant recipients based on financial need and established renewal requirements.	Up to \$3,000 per year. Maximum award amounts may vary from year to year and may be impacted by other institutional aid awards. Renewable with a 2.5 cumulative GPA and FAFSA received annually by the priority deadline.	Student must complete the FAFSA
Eustace B. Nifkin Scholarships	Children or grandchildren of ESF alumni enrolled in full-time undergraduate study. Up to five winners selected each year.	\$250 per semester for up to ten semesters. Renewable with cumulative GPA of 2.5 or higher.	Complete family question on ESF's Supplemental Application for Admission to be considered.
Paper Science and Engineering Scholarships (Syracuse Pulp & Paper Foundation)	United States citizens enrolled in or admitted to the Chemical Engineering or other academic departments.	Awarding rules are available at Chemical Engineering website	Application rules are available at Chemical Engineering website
ESF College Foundation Awards	Students with financial need or academic merit enrolled at least half-time.	Amounts for these awards vary based on financial need and other criteria.	Student must complete the FAFSA
Haudenosaunee Scholar Awards	Certified citizenship in Mohawk, Oneida, Onondaga, Cayuga, Seneca or Tuscarora nations.	\$5,000 per year (full-time study only). Up to two scholarships awarded each year.	Application available on Office of Financial Aid and Scholarships website .
Phi Theta Kappa Scholarships	Community college transfer students who are members of PTK honor society.	\$1,500 per year. Renewable with GPA of 3.00 or higher.	Proof of PTK membership submitted with application for admission.
National Merit, National Achievement, and	Semifinalists or finalists in any of these three	Combined ESF Presidential and Merit Scholarships totaling up to \$8,000	High school records provided for admission must indicate student's

National Hispanic Scholarships	national scholarship programs.	per year. Maximum award amounts may vary from year to year and may be impacted by other institutional aid awards. Renewable.	semifinalist or finalist selection.
Centennial Hall Scholarships	Students with financial need who reside on campus in Centennial Hall.	Amount varies based upon financial need and other institutional aid awards.	Students must complete the FAFSA .
Tuition Match Scholarships	Incoming first-year students from select states. Specific states and availability vary from year to year. Eligibility is dependent on SUNY approval and ESF participation in the program.	Award amounts vary and are contingent on the annual ESF non-resident tuition rate and the established tuition rates at identified flag-ship institutions in the students' home states. Amounts are also subject to change based on other institutional aid a student may receive.	All first-year applications submitted by February 1 will be reviewed for possible selection.

State and Federal Government Grants

Scholarship or Grant	Eligibility	Amount	Where to Apply
Federal Pell Grant	Enrolled full-time, three-quarter-time, half-time, or less than half-time undergraduate students who demonstrate financial need.	From \$7,395 for standard academic year. Award amounts may be subject to change based on federal aid regulations.	Students must submit the FAFSA
Federal Supplemental Educational Opportunity Grant (FSEOG)	Full-time, three-quarter-time, or half-time undergraduate students with exceptional need.	Varying, depending upon financial need and available funds.	Students must submit the FAFSA

New York State Tuition Assistance Program (TAP)	Full time students at any accredited college in New York State. Resident of New York State. Must demonstrate financial need.	\$500 to \$5,665 for undergraduates, depending on NYS net taxable income and dependency status.	Students must submit the FAFSA and the TAP Application
Part-Time New York State Tuition Assistance Program (TAP)	TAP eligible undergraduate students enrolled in 6-11 credit hours per semester.	Amounts based on a prorated percentage of the full-time TAP grant equivalent.	Students must complete the FAFSA and the TAP application.
Educational Opportunity Grant (EOP)	Undergraduate students. Resident of New York State. For educationally and economically disadvantaged students.	Varies according to individual need. Applicants must be accepted into the program through the admissions process.	Guidelines are in the SUNY Application for Admission. Submit the FAFSA.
New York State Science, Technology, Engineering and Mathematics Incentive (STEM)	Undergraduate students. Resident of New York State. Top 10% of high school class. Must enroll in STEM approved major, reside and work in STEM related field in New York State for 5 years following graduation. 2.5 cumulative GPA each semester. • List of NY STEM approved SUNY ESF majors	Up to full tuition, depending on eligibility for other New York State grants and scholarships. May affect eligibility for SUNY-ESF grants and scholarships.	Students must complete the NY STEM Scholarship application . Recipients must also sign a service contract.
New York State Excelsior Scholarship	Undergraduate students. Resident of New York State. Total family Federal Adjusted Income not exceeding \$125,000 (2022 Tax Information) for the 2024-2025 school year (2023 Tax Information) for	Up to \$5,500, depending on eligibility for other grants and scholarships. May affect eligibility for SUNY ESF grants and scholarships. An additional Excelsior Tuition Credit may also be awarded to students who	Students must complete the Excelsior Scholarship application . Residents must also sign a residency contract and meet numerous other requirements. Details

	the 2025-2026 school year.	have remaining tuition liability after the scholarship is applied.	
New York State AIMS Scholarship	Undergraduate students. Resident of New York State.	\$500 per year.	Students must complete the AIMS Scholarship application .

Federal Student Loans

Loan Program	Eligibility	Amount	Where to Apply
Federal Direct Loan NOTE: Repayment begins 6 months after you graduate or fall below half-time status. The default repayment length is ten years. There is a 1.057% origination fee (for the federal government) deducted proportionately from your loan proceeds. The 2025-2026 interest rate is 6.39% for undergraduate student loans and 7.94% for graduate student loans.	For all full-time, three- quarter-time, or half- time students. There are subsidized loans (interest-free while in school) and unsubsidized loans (student responsible for interest while in school). Students borrow from the Federal Government. Loans are processed through the College. NOTE: Direct loans may be subsidized or unsubsidized or a combination. A subsidized loan is such that interest does not accrue while the borrower is in school. An unsubsidized loan is such that the borrower must make interest-only payments while in school or allow interest payments to be added to the principal.	Dependent Students: The maximum per year is \$5,500 for freshmen, with no more than \$3,500 subsidized; \$6,500 for sophomores, with no more than \$4,500 subsidized; \$7,500 for juniors and seniors, with no more than \$5,500 subsidized. The borrowing limit for dependent undergraduate students is \$31,000, with no more than \$23,000 subsidized. Independent students or students whose parents cannot borrow under the Federal Direct PLUS Loan Program: The subsidized and unsubsidized maximum per year is \$9,500 for freshmen, \$10,500 for sophomores, and \$12,500 for juniors and seniors. The borrowing limit for independent undergraduate	Students must submit the Free Application for Federal Student Aid (FAFSA) .

		students is \$57,500, with no more than \$23,000 subsidized. Graduate or Professional Students: The unsubsidized maximum is \$20,500 per year (borrowing limit is \$138,500 over lifetime in school). Interest subsidized loans will not be available to new graduate borrowers after 7/1/12.	
Federal Direct PLUS Loan	For parents or guardians of financially dependent undergraduate students. Graduate students may also borrow Direct PLUS loans.	The maximum is the cost of education at ESF minus any estimated financial aid. Borrowers must meet established credit criteria. Loan repayment begins 60 days after the loan is fully disbursed. The 2025-2026 interest rate is 8.94%. There is a 4.228% loan origination fee.	Students must submit the Free Application for Federal Student Aid (FAFSA) .

Student Employment

Employment Program	Eligibility	Amount	Where to Apply
Federal Work-Study	For full-time, three-quarter-time, or half-time students with financial need.	Opportunities for employment are offered during the academic year and/or summer. Students may work up to 20 hours per week when classes are in session or up to 40 hours per week during vacations. Hourly	Students must submit the FAFSA application and the appropriate tax forms.

		wages up to \$15.00 per hour.	
Job Location and Development Program	For all ESF students. Students are connected to job opportunities with local employers.	Wage and hours will vary according to job offers.	Apply by visiting the ESF job locator in the Financial Aid Office.

Graduate Student Assistantships

Assistantships	Eligibility	Amount	Where to Apply
Graduate Assistantships	Assistantships sponsored by N.Y. State and various research projects are available. Students assist with instruction, research, and support operations for an assigned program area.	Weekly hours of employment and award ranges are determined by the awarding department, and a tuition scholarship may also be provided. Financial need is not a criterion for qualification.	The application for admission serves as the application for graduate assistantships for beginning students. Continuing students should contact their department chair.

DEGREE PROGRAMS AND AREAS OF STUDY

Undergraduate Programs

- **Other Undergraduate Study Pages**

- [General Education](#)
- [Minors](#)
- [Special Academic Options](#)

ESF is authorized by the New York State Department of Education to offer undergraduate and graduate degree programs as described in this catalog. A comprehensive list of degree programs is provided below.

The Higher Education General Information Survey (HEGIS) code is the number assigned to programs registered by the commissioner of the New York State Department of Education. The Classification of Instructional Programs (CIP) Code allows the U.S. Department of Education to track educational programs for financial aid eligibility. Enrollment in programs that are not registered or otherwise approved may jeopardize a student's eligibility for certain financial aid programs.

Associate in Applied Science (A.A.S.)

- [Environmental and Natural Resources Conservation](#) (HEGIS Code 5403, CIP Code 030101)
- [Forest Technology](#) (HEGIS Code 5403, CIP Code 030511)
- [Land Surveying Technology](#) (HEGIS Code 5309, CIP Code 151102)

Bachelor of Landscape Architecture (B.L.A.)

- Landscape Architecture (HEGIS Code 0204, CIP Code 040601)
 - [B.L.A./M.S. Fast-Track](#) (HEGIS Code 0204, CIP Code 040601)

Bachelor of Science (B.S.)

- [Aquatic and Fisheries Science](#) (HEGIS Code 0115, CIP Code 261304)
- [Biochemistry](#) (CIP Code 260202)
- [Bioprocess Engineering](#) (HEGIS Code 0905, CIP Code 140501)
- [Biotechnology](#) (HEGIS Code 0499, CIP Code 261201)
- [Chemical Engineering](#) (HEGIS Code 0906, CIP Code 140701)
- [Chemistry](#) (HEGIS Code 1905, CIP Code 400501) with options in biochemistry and organic chemistry of natural products, environmental chemistry, or natural and synthetic polymer chemistry.
- [Conservation Biology](#) (HEGIS Code 0420, CIP Code 261307)
- [Construction Management](#) (HEGIS Code 0599, CIP Code 522001) with elective concentration in sustainable construction and renewable materials.
- [Environmental Biology](#) (HEGIS Code 0420, CIP Code 261305)
- [Environmental Education and Interpretation](#) (HEGIS Code 0499, CIP Code 269999)
- [Environmental Health](#) (HEGIS Code 0420)
- [Environmental Resources Engineering](#) (HEGIS Code 0999, CIP Code 141401)
- [Environmental Science](#) (HEGIS Code 0420, CIP Code 030104) with options in renewable energy, environmental information and mapping, watershed science, health and the environment, earth and atmospheric systems science or environmental analysis.

- [Environmental Studies](#) (HEGIS Code 0420, CIP Code 030103) with options in biological science applications; environmental policy, planning and law; or environment, communication and society.
- [Forest Ecosystem Science](#) (HEGIS Codes 0114, CIP Code 261307)
- [Forest Health](#) (HEGIS Code 0114, CIP Code 030502)
- [Forest Resources Management](#) (HEGIS Code 0115, CIP Code 030501)
- [Natural Resources Management](#) (HEGIS Code 0115, CIP Code 030201)
- [Paper Engineering](#) (HEGIS Code 0999, CIP Code 144001)
- [Renewable Materials Science](#) (HEGIS Code 0999, CIP Code 144001)- *not accepting new students*
- [Sustainability Management](#) (online, CIP Code 303301)
- [Sustainable Energy Management](#) (HEGIS Code 0115, CIP Code 030201)
- Undeclared Option (open to first-year students)
- [Wildlife Science](#) (HEGIS Code 0107, CIP Code 260709)

Graduate Programs

- Graduate Study: Degrees & Options

Chemical Engineering

(HEGIS Code 0999, CIP Code 144001)

M.S., M.P.S. and Ph.D. in Paper and Bioprocess Engineering (*not accepting students*)

M.S., M.P.S. and Ph.D. in Paper Science and Engineering

- [Paper Science and Engineering](#) (Pulping and Bleaching Processes (M.S., Ph.D.), Colloidal Chemistry and Fiber Flocculation (M.S., Ph.D.), Fiber and Paper Physics (M.S., Ph.D.), Process and Environmental Systems Engineering (M.P.S., M.S., Ph.D.), Pulp and Paper Technology (M.P.S.))

M.P.S. in Sustainable Engineering Management

- [Sustainable Engineering Management](#) (Areas of Study include: Bioprocess Engineering, Paper Engineering)

Chemistry

(HEGIS Code 1905, CIP Code 400509)

M.S., M.P.S. and Ph.D. in Chemistry with areas of study in:

- [Biochemistry](#)
- [Environmental Chemistry](#)
- [Organic Chemistry of Natural Products](#)
- [Polymer Chemistry](#)

Environmental Biology

(HEGIS Code 0499, CIP Codes 261307)

M.S., M.P.S. and Ph.D. in Environmental Biology with areas of study in:

- [Aquatic & Fisheries Science](#)
- [Chemical Ecology](#) (with the Dept. of Chemistry)
- [Conservation Biology](#)
- [Ecology and Evolution](#)

- Entomology
- Environmental Biotechnology
- Indigenous Peoples & the Environment
- Microbiology
- Molecular Biology & Ecology
- Mycology & Forest Pathology
- Plant Science
- Wildlife Ecology & Management

Environmental Resources Engineering

(HEGIS Code 0999, CIP Code 141401)

M.E., M.S., M.P.S. and Ph.D. in Environmental Resources Engineering with areas of study in:

- Ecological Engineering
- Environmental Management
- Environmental Resources Engineering (note: M.E. is not accepting new students)
- Geospatial Information Science and Engineering
- Water Resources Engineering

Environmental Science

(HEGIS Code 0420, CIP Code 030104)

M.S., M.P.S. and Ph.D. in Environmental Science with areas of study in:

- Climate and Energy
- Ecosystems: Land, Water and Air
- Policy, Planning, Communication and Society

Environmental Studies

(HEGIS Code 0420, CIP Code 030103)

M.S. and M.P.S. in Environmental Studies with areas of study in:

- Environmental Communication
- Environmental Policy
- General Environmental Studies
- Graduate Certificates
 - Environmental Decision Making
 - Environmental Justice and Inequality (online)
 - Environmental Leadership (online)
 - Science and Environmental Communication (online)
- *M.P.S. in:*
- Environmental Leadership, Justice, and Communication (online)

Landscape Architecture

(HEGIS Code 0204, CIP Code 040601)

Master of Landscape Architecture (M.L.A.) and M.S. in Landscape Architecture with areas of study in:

- Community Design and Planning
- Cultural Landscape Studies and Conservation
- Landscape and Urban Ecology

Sustainable Resources Management

(HEGIS Code 0115, CIP Code 030506)

M.S., M.P.S. and Ph.D. in Forest Resources Management with areas of study in:

- [Ecology and Ecosystems](#)
- [Economics, Governance and Human Dimensions](#)
- [Forest Management & Silviculture](#)
- [Monitoring, Analysis and Modeling](#)

M.S. , M.P.S. and Ph.D. in Natural Resources Management (CIP Code 3.0199)

- [Natural Resources Management](#)

M.S. , M.P.S. and Ph.D. in Sustainable Construction Management with areas of study in:(CIP Code 14.3301)

- [Construction Management](#)
- [Sustainable Construction](#)

M.S. , M.P.S. and Ph.D. in Sustainable Energy (CIP Code 30209)

- [Sustainable Energy](#)

Master of Forestry (M.F.)

- [Forest Management and Operations](#)

Graduate Certificate

- [Climate Sustainability Leadership](#)
- Graduation Rate for Undergraduate Students

Graduation rate and retention information are available on the ESF [Student Consumer Information website](#). Graduation rate data is also published annually on the federal government's College Navigator website.

GENERAL EDUCATION

About General Education

The SUNY GE framework includes twelve categories of knowledge, skills and competencies—ten knowledge and skills areas expose students to different ways of knowing so that they can make reasoned judgements outside as well as inside their academic field, and enabling them to develop diverse perspectives and global understanding; and two core competencies that extend beyond discipline-specific knowledge and skills. The core of the curricula for all ESF undergraduate degree programs includes the mandatory knowledge and skills area for the natural science and scientific reasoning, communication (written and oral), mathematics and quantitative reasoning, and diversity, equity, inclusion, and social justice. For the remaining general education knowledge and skill area requirements, students must select courses chosen from at least three of the remaining knowledge and skill areas, or as specifically designated by their degree programs.

The courses listed below may be chosen to satisfy SUNY general education requirements in each of the knowledge and skill areas. Please note that more than 40 of these courses are taught in the College of Arts and Sciences at Syracuse University, including all courses in World Languages. General education courses listed with the prefix APM, EFB, EST, FCH, FOR, LSA, PSE, or SRE are taught at SUNY ESF and can be found in the Course Descriptions section of this catalog. [Syracuse University courses descriptions](#).

General Education Requirements

*Mathematics and Quantitative Reasoning**

APM 103

APM 104

APM 105

APM 106

APM 115

APM 205

APM 391

*Natural Sciences and Scientific Reasoning**

EFB 100

EFB 101

EFB 102

EFB 103	
EFB 104	
EFB 120	
EFB 320	
FCH 110	
FCH 150	
FCH 151	
FCH 152	
FCH 153	
FCH 210	
FCH 221	
FCH 222	
FCH 223	
FCH 224	
FOR 110	
FOR 232	
PHY 211	3
PHY 221	1
PHY 222	1
SRE 225	
<i>Social Sciences</i>	
EFB 120	
EST 203	
EST 221	
EST 366	
EST 390	

FOR 207		
MAX 132		3
PST 101		3
PSC 123		3
PSC 124		3
PSC 125		3
PSY 205		3
SOC 248		3
SOC 281		3
<i>US History and Civic Engagement</i>		
EHS 150		
EST 201		
EST 202		
EST 361		
HST 101		3
HST 102		3
<i>World History and Global Awareness</i>		
AAS 241	African Religions: An Introduction	3
ANT 121		3
ANT 185		3
ANT 324	Modern South Asian Cultures	3
ANT 326		3
EFB 217		
EFB 305		

EST 140		
EST 200		
EST 204		
GEO 272		3
HOA 105		3
HOA 106		3
HST 111		3
HST 210		3
HST 211		3
HST 320		3
HST 321		3
JSP 114		3
LIT 203	Greek&Roman Epic in Eng Translation	3
LIT 211		3
LSA 205		
LSA 206		
LSA 305		
PSC 125		3
PSE 201		
REL 101		3
REL 114		3
REL 185		3
REL 186		3
REL 205		3
REL 206		3
SAS 324		3

OR
WGS 324

*Diversity: Equity, Inclusion and Social Justice**
EST 135

EST 140

EST 204

EST 205

EWP 311

LSA 212

Humanities
AAS 231

AAS 235	African American Drama	3
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ENG 107		3
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ENG 151		3
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ENG 153		3
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ENG 192		3
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EWP 290

LIN 201		3
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LIT 203	Greek&Roman Epic in English Translation	3
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PHI 107		3
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PHI 111	Plato's Republic	3
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REL 135	Judaism	3
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REL 156	Christianity	3
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REL 217	The New Testament	3
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REL 231	Judaic Literature	3
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REL 252	Religious Ethics	3
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Social Issues

<i>The Arts</i>		
APH 261		3
ENG 215		3
ENG 217		3
EWP 350		
HOA 105		3
HOA 106		3
HOA 201		
HOA 377	Nineteenth-Century American Art	3
HOM 125		3
HOM 165		3
LSA 182		
LSA 201		
LSA 205		
LSA 206		
LSA 220		
LSA 222		
MTC 125		3
PSE 201		

*Communication (written and oral)**

EWP 190

EWP 220

*Denotes required category

**Fulfills both written and oral communication

†Fulfills oral communication only

SU^ Syracuse University course

MINORS

Minors

Undergraduate Study

In addition to academic majors available at ESF, many departments offer academic “minors” for undergraduate students to build an area of additional breadth outside their major program of study. Admission to undergraduate minors for ESF students is via petition, with additional application requirements as noted in the descriptions of the minors below, along with a minimum cumulative GPA of 2.7. Successful completion of a minor will be noted on the transcript of each student.

Applied Statistics Minor

Coordinator: Dr. Eddie Bevilacqua

This minor provides students with an opportunity to extend their understanding of and ability to apply statistical methods beyond the basic techniques presented in introductory courses. The minor is intended to provide students with a strong background in statistical design (both sampling design and experimental design) and analysis. The 12-credit minor consists of two required courses (6 credits), APM 210 (or APM 395) and FOR 323 and 6 credits of directed electives of advanced courses, independent study, or teaching experience related to applied statistics.

Courses:

This minor requires 12 credits and includes the required courses (6 credits) and directed electives (6 credits) listed below. Other applied statistics courses may be substituted by petition for any course in the directed elective list with the approval of the SRM Undergraduate Education Committee.

Required Courses (6 credits):

Course		Credits
APM 210 OR APM 395	Introduction to Probability and Statistics Introduction to Statistics in Engineering	3 (cannot use both)
FOR 323	Forest Biometrics	3

Directed Electives (6 credits):

Course		Credits
APM 620	Experimental Design and Analysis of Variance	3

APM 625	Sampling Methods	3
APM 630	Regression Analysis	3
APM 635	Multivariate Statistical Methods	3
APM 645	Nonparametric Statistics and Categorical Data Analysis	3
FOR 495	Undergraduate Teaching Assistance (must be in association with APM 210 or FOR 323)	1
FOR 498	Independent Study (under guidance of instructor of APM applied statistics courses)	2-3
MAT 222	Elementary Probability and Statistics II	3
MAS 362	Decision Tools for Management	3
MAX 201	Quantitative Methods for the Social Sciences	3

Eligibility requirements:

Students from all programs at ESF are eligible for this minor if they have a cumulative grade point average of 3.0 or better after one semester at ESF (or as a transfer student with same standing).

Bioprocess Science Minor

Coordinator: Dr. Gary Scott

The bioprocess science minor gives students an understanding of the rapidly developing bioprocessing industry, which uses the chemical, physical and biological processes developed by living organisms or their cellular components in a type of advanced manufacturing of specialty commercial products. Bioprocess science will influence diverse fields as it becomes widely used, such as for producing energy from sustainable sources.

The bioprocess science minor is available to all ESF undergraduate students (**except students in the bioprocess engineering program**) who maintain a minimum cumulative grade point average of 2.70, and who desire to develop greater knowledge of bioprocess science and its related fields. Interested students must submit a petition and application form, with courses listed, to their academic advisor and the chair of their department, with final approval from the dean of Instruction and Graduate Studies. Students should declare the minor by the end of the sophomore year, but may petition to their home department for enrollment at any time after that. Successful completion of the minor will be noted on the student's transcript.

Eighteen credit hours (6 courses) are required to satisfy the minor. Specified courses: PSE 370 Principles of Mass and Energy Balance (3); BPE 310 Colloid and Interface Science (3); BPE 420 Bioseparations (3); and at least three directed elective courses available from both ESF and

Syracuse University including biology, forestry, chemical engineering, chemistry, paper science and engineering, bioprocess engineering, and environmental and biological engineering. Students are required to complete at least one course from a list of biological and chemistry electives and at least one course from a list of engineering electives. The complete list of courses is available from faculty advisors.

Biotechnology Minor

Coordinator: Dr. Christopher Whipps

The minor in biotechnology is for students who wish to add knowledge of biotechnology theories and methodologies to the experiences and qualifications gained from their undergraduate program. Required courses develop a basis for understanding biotechnology, both at the theoretical and practical levels. Directed electives allow students to focus on an area of interest in the field. The minor is available to all ESF undergraduate students except those in the biotechnology major. Admission requires a minimum cumulative GPA of 2.7.

Nineteen credit hours of coursework are required for completion of the minor. Sixteen credits of specified courses include EFB 307 Principles of Genetics (3); EFB 308 Principles of Genetics Lab (1); BTC 401 Molecular Biology Techniques (3); EFB 325 Cell Biology (3); FCH 430 Biochemistry I (3); and FCH 432 Biochemistry II (3). One directed elective course (for a minimum of three credits) must be selected from the following list. Other courses may be applicable with petition but cannot include BTC 420, 495, 498. A maximum of eight credits can count toward both major and minor requirements; overlap in excess of this number must be offset by taking additional courses from the directed elective list.

- BTC 425 Plant Biotechnology (3)
- BTC 426 Plant Tissue Culture Methods (3)
- EFB 303 Introductory Environmental Microbiology (4)
- FCH 431 Biochemistry Lab (3)
- FCH 584 Spectro ID/Organic Compounds (3)
- MCR 484 Scanning Electron Microscopy (3)
- MCR 485 Transmission Electron Microscopy (3)
- BIO 440 (M001): Applied Genomics (3) (SU)
- BIO 446 Epigenetics of Human Health and Disease (3) (SU)
- BIO 447 Basic Immunology (3) (SU)
- BIO 448 Evolutionary Medicine (3) (SU)
- BIO 462: Molecular Genetics (3) (SU)
- BIO 464 Applied Biotechnology (4) (SU)
- BIO 468 Microbiomes Biotech & Medicine (3) (SU)
- BIO 473 Pharmaceuticals & Cells (3) (SU)
- MEDT 439 Applied Techniques in Medical Biotechnology (2) (SUNY Upstate)

Chemistry Minor

Coordinator: Ted Dibble

The Minor in Chemistry is open to all undergraduates at SUNY ESF. Admission to the Chemistry minor requires sophomore, or higher, status, students to have completed one year of General Chemistry (I and II) with lab (8 credits) and one year of Organic Chemistry (I and II) with lab (8 credits).

To enroll in the Chemistry Minor, fill out the form [How to Declare a Minor in Chemistry](#) and the [ESF Minor Enrollment Form](#) and bring them to the Coordinator of the Chemistry Minor

Fifteen credit hours of upper division chemistry credits (300 level or above) are required from a list of suggested courses, including:

Required Courses

Course Number	Course	Codes *	Credits
FCH 325	Organic Chemistry III		4
FCH 360	Physical Chemistry I		3
FCH 361	Physical Chemistry II		3
FCH 380	Analytical Chemistry I		2
FCH 382	Analytical Chemistry I Lab		1
FCH 381	Analytical Chemistry II		3
FCH 410	Inorganic Chemistry		3
FCH 430 OR FCH 530	Biochemistry I Biochemistry I		3 3
FCH 431 OR FCH 531	Biochemistry Laboratory Biochemistry Laboratory		3 3
FCH 432 OR FCH 532	Biochemistry II Biochemistry II		3 3
FCH 510	Environmental Chemistry I		3
FCH 511	Atmospheric Chemistry		3
FCH 515	Meth/Envrn Chem Analysis		3
FCH 550	Polymer Sci:Synth&Mech		3
FCH 551	Polymer Techniques		3
FCH 552	Polymer Sci:Prop&Tech		3
FCH 584	Spectro ID/Organic Compounds		3

Computer and Information Technology Minor

Coordinator: Dr. Gary Scott

The computer and information technology minor is available to all ESF undergraduates who want to develop greater skill in computer science and information technology applications. By understanding the basic principles behind software development, students can more effectively use these tools in their chosen fields. To be eligible for this minor, a student must have a cumulative grade point average of 2.700 or better by the end of the sophomore year. Interested students must submit a minor enrollment form to their academic advisor and the minor coordinator for approval.

Seventeen credit hours (6 courses) in computer science courses, information technology courses, and other strongly computer-based and analysis courses are required to complete the minor.

Required Courses (11 credits)

- Choose One:
 - GNE 160 Computing Methods for Engineers and Physical Scientists (3)
 - ERE 335 Numerical and Computing Methods (3)
 - CIS 151 Fundamentals of Computing and Programming
 - CPS 196 Introduction to Computer Programming
- ESF 200 Information Literacy (1)
- CIS 252 Introduction to Computer Science (4)
- CIS 351 Data Structures (3)

Elective Courses (6 credits)

ERE 445 Hydrologic Modeling (3)
ERE 530 Numerical and Computing Methods (3)
ERE 551 GIS for Engineers (3)
ERE 533 Ecological Modeling (3)
ERE 622 Digital Image Analysis (3)
ESF 300 Introduction to Geospatial Information Technologies (3)
CIS 3xx/4xx/5xx Any CIS course offered at the 300, 400, and 500 level
CPS 234 - Introduction to Computational Thinking
CPS 333 - UNIX Operating System and Internet
CPS 335 - JAVA programming for the Internet
CPS 504 - Introduction to C++
CPS 506 - Introduction to C
CPS 551 - Computer Organization & Operating System Design
CSE 261 - Digital Logic Design
CSE 262 - Digital Logic Design Laboratory
CSE 283 - Introduction to Object-Oriented Design
CSE 381 - Computer Architecture
CSE 382 - Algorithms & Data Structures
CSE 384 - Systems and Network Programming
CSE 389 - Web System Architecture and Programming
CSE 398 - Embedded and Mobile Systems Laboratory
CSE 418 - Deep Learning
CSE 444 - Mobile Application Programming
CSE 458 - Data Networks: Basic Principles
CSE 464 - Introduction to VLSI Design
CSE 483 - C# and Windows Programming
CSE 484 - Introduction to Computer and Network Security

CSE 486 - Design of Operating Systems
 CSE 487 - Access Control, Security and Trust
 CSE 488 - Introduction to Internet Security
 CSE 561 - Digital Machine Design
 CSE 581 - Introduction to Database Management Systems

Construction Management Minor

Coordinator: Dr. Endong Wang

The construction management minor is available to all ESF undergraduates (except students in construction management) and prepares students for management careers in the construction industry. Admission to the minor requires sophomore status, with a cumulative grade point average of 2.70 or higher.

Eighteen credit hours (6 courses) are required to complete the minor. Four courses are specified, with an additional two courses selected from the list of four courses given below. A cumulative grade point average of 2.000 or higher is required for the construction management courses.

Specified Courses

Course Number	Course	Codes *	Credits
CME 255	Plan Interpn&Quantity Takeoff		3
CME 343	Construction Estimating		3
CME 453	Construct Plan/ Scheduling		3
CME 454	Construction Project Mgt		3

Two additional courses are chosen from the following

Course Number	Course	Codes *	Credits
CME 331	Construction Safety		3
CME 335	Cost Engineering		3
CME 444	Materials Marketing		3
CME 455	Construct Contracts/ Specs		3

Economics Minor

Coordinator: Dr. John Wagner

Economics analyzes how people with limited resources make choices and provides the fundamentals for good decision-making. The minor in economics provides students with common microeconomic models and tools that can be used to analyze optimal management and policy decisions in natural resources management.

The Economics minor totals 15 credits.

Required Courses

Course Number	Course	Codes *	Credits
FOR 207	Introduction To Economics		3
SRE 454	Sustainable Energy Fin&Analysis		3

In addition, students must choose from the following directed electives (a minimum of 9 credits)

Directed Electives

Course Number	Course	Codes *	Credits
ECN 301	Intermediate Microeconomics		3
ECN 311	Intermediate Mathemat. Micro		3
ERE 430	Engr Decision Analysis		3
FOR 333	Natural Resrc Managerial Econ		3
FOR 495	Undergrad Teaching Assistance		1 - 3
FOR 670	Resource & Envrn Economics		3
SRE 422	Energy Markets and Regulation		3

It is the responsibility of the student to meet any prerequisites associated with courses in the minor.

Admission to the minor requires students to have a cumulative grade point average of 2.70 or better after one semester at ESF (or as a transfer student with the same standing).

Environmental Biology Minor

Coordinator: Dr. Greg McGee

This minor provides students the opportunity to explore fundamentals of molecular, cellular and organismal biology and ecology, and to develop laboratory and field proficiencies in the discipline. The minor is open all ESF undergraduate students who maintain a GPA of at least 2.70 after completing at least one semester at ESF and who have completed EFB 101/102 & 103/104 General Biology (8 cr) or their equivalents, and one semester of introductory chemistry with laboratory (4 cr).

Eighteen credit hours of biology courses are required to satisfy the minor, including: EFB320 General Ecology (4 cr); EFB307/308 Principles of Genetics w/ laboratory (4 cr); EFB311 Principles of Evolution (3 cr); 7 cr of directed biology electives that may include: EFB202, either EFB 210 or 211, and any 300+ level EFB course except EFB 420, 495, 498.

A maximum 6 of 18 credits may count toward both major and minor degree requirements, including directed electives; overlap in excess of 6 credits must be offset by taking additional 300+ biology courses.

Environmental Health Minor

Coordinator: Dr. Lee Newman

The Environmental Health minor will introduce students to environmental health with a core context of epidemiology and toxicology; the minor requires 15-17 credit hours. There are 3 required courses (7 credit hours): EHS250 Foundations of Environmental Health(1), EFB360 Epidemiology(3), and EFB400 Toxic Health Hazards(3). Students will have the flexibility to explore a variety of components by selecting an additional three courses (8-10 credit hours) from among the following: EHS440 Occupational Health and Safety(3), EHS350 Environmental Health Management(3), EHS320 Disease Prevention(2), FST102 Food fights: Contemporary Food Issues(3), FCH399 Introduction to Atmospheric Science(3), ENS470 Environmental Risk Assessment(3), EST245 Foundations of Environmental Communication(3), EHS480 Hazardous Waste Management(3), EFB303 Introductory Environmental Microbiology(4).

The Environmental Health minor will be available to students in all majors (except Environmental Health) who want to increase their knowledge of the impact of the physical environment on human health.

Some of the courses have additional pre-requisites, and students should investigate this before selecting courses to fulfill the minor requirements.

Students must have a minimum GPA of 2.7 to apply. Interested students should submit the minor enrollment form accompanied by a list of courses to fulfill the minor requirements to their faculty advisor and the Environmental Health minor coordinator, with final approval from the Dean of Instruction and Graduate Studies.

Environmental Policy and Communication Minor

Coordinator: Dr. Andrea Feldpausch-Parker

The minor in Environmental Policy and Communication is designed to provide students with the knowledge and skills to navigate the environmental policy process, to effectively communicate

with diverse stakeholders in public and private spheres, and to critically reflect on and elucidate the interactions between scientific knowledge, social processes, and environmental problem-solving.

The Environmental Policy and Communication Minor is available to all ESF undergraduates.

Twelve credit hours are required. All students must take a course on the Fundamentals of Environmental Policy (typically EST 321, Government and the Environment). Additionally, to complete the minor, students must take a course in Environmental Communication; an Upper Level Course in Environmental Policy, Leadership, or Decision Making; and a course in Critical Perspectives on Environment & Society. Admission to the minor requires sophomore status with a cumulative GPA of 2.70 or better.

Students in the Environmental Studies department pursuing the Options in either Environment, Communication and Society or Environmental Policy, Planning and Law should work with their advisor and the Environmental Policy and Communication Program Lead to ensure that the minor is complementary rather than redundant with their option. No more than 6 credits may be double-counted for both the Minor and an Option.

Required Courses (12 credits total):

1) A Course in the Fundamentals of Environmental Policy (3 Credits)

- Government and the Environment (EST 321)

2) A Course in Environmental or Science Communication (3 Credits)

- Public Communication of Science & Technology (EST 395)
- Environmental Communication Workshop (EST 493)

3) An Upper Level Course in Environmental Policy or Decision Making (3 Credits)

- Community Planning & Sustainability (EST 426)
- Environmental & Energy Auditing (EST 427)
- Land Use Law (EST 460)
- Environmental Impact Analysis (EST 550)
- Comprehensive Land Planning (LSA 451)

4) A Course on Critical Perspectives on Environment & Society (3 Credits)

- Environmental Justice (EST 415)
- Attitudes, Values & The Environment (EST 366)
- Social Processes of the Environment (EST 390)
- Indigenous Issues and the Environment (EFB 305)

Additional relevant 300 and 400-level courses (from ESF or SU) may be acceptable

Environmental Writing and Rhetoric Minor

Contact: Jacob Gedetsis

The Writing Program at ESF is a space where artistic and humanistic insights can find creative ways to address our ecological crisis. The Environmental Writing minor creates a path to develop the expertise of environmentally-minded humanists and artists to make sense of, represent, and respond holistically to the natural world. Students in the minor engage in audience-centered approaches to writing, reading, and communicating across genres and contexts. They develop skills in environmental storytelling, digital

literacies, and presentation to better prepare them to be active participants in academic,

professional, and civic life. Why add this minor? Our students find that there are often multiple skill sets that careers demand of them and increasing one's exposure to, and practice of, writing can help with job placement and security. The minor also provides the ability to flex already existing interests in the creative world, all while exploring how writing functions in public spheres. Whether you love to read or write, the minor provides an opportunity to engage with wide-ranging composition skills, including criticism, creative writing, journalism, publishing, editing, and tutoring.

Prerequisites (6 Credits)

EWP 190: Writing and the Environment

EWP 290: Research Writing and Humanities (also offered in the summer; covers General Education Humanities)

Or equivalent courses from AP or transfer credit

Coursework (12 credits total):

Required Core Course (3 Credits)

- **EWP 300: Survey of Environmental Writing**

Choose Two Additional EWP Courses (6 credits)

- **EWP 292 The Art of Fiction**
- **EWP 293 The Art of Poetry**
- **EWP 295 World Literature: Ecological Perspective**
- **EWP 311: Urban Environmental Literature**
- **EWP 350: Eco-Cinema: Perspectives and Practices**
- **EWP 360 Queer Ecologies**
- **EWP 390: Literature of Nature**
- **EWP 394: Art of Storytelling**
- **EWP 407: Writing for Environmental & Science Professionals**
- **EWP 420: Advance Public Presentation Skills**
- **EWP 490: Contemporary Literature of Nature**
- **EWP 494: Creative Non-Fiction in the Sciences**
- **EWP 495: Environmental Journalism**

Directed Electives (3 Credits)

**EWP 401 Capstone Experience (with permission of instructor) or
Another 3 credit, EWP course from the above list.**

Food Studies Minor

Coordinator: Dr. Lee Newman (not accepting new students)

The food studies minor will be available to students in all majors who want to increase their knowledge of the impact of food production systems, food security and food systems on human society and individual human health.

Some of the directed elective courses have additional pre-requisites, and students must investigate this before making up their proposed course plan.

Interested students (GPA 2.7 required in order to apply) must submit a petition, with a list of potential courses to fulfill the minor requirements to (a) their faculty advisor, (b) the undergraduate curriculum coordinator of their home department and (c) the food studies minor coordinator, with final approval from the Dean of Instruction and Graduate Studies.

Many of these courses are offered at Syracuse University. Students pursuing this minor may incur additional fees as required for exceeding their SU accessory instruction allocation.

Requirements

For the Minor, all students must take 6 courses distributed as follows among 3 categories:

Two required lower division courses:

- FST 102 Food Fights: Contemporary Food Issues (3)
- FST 202 Agroecology (3)

Select one among the following courses:

- EFB 337 Field Ethnobotany (3)
- EFB 437 Plant Propagation (3)
- EST 361 History of the American Environmental Movement (3)

Select three among the following courses:

- FST 204: Food, identity and Power (3)
- FST 303 Food Movements (3)
- FST 304 Farm to Fork (4)
- FST 306 Food Cooperatives (3)
- FST 307 Feeding the World: Global Agri-food Governance (3)
- FST 309 Philosophy and Practice of Locavorism (3)
- FST 310 Will Work for Food: Labor Across the Food System (3)
- FST 312 Emergency Food Systems (3) ***Note: This course is not offered each year.
- FST 402 Feeding the City: Urban Food Systems (3)
- FST 403 The Human Right to Adequate Food and Nutrition (3)
- FST 421 Morality of a Meal: Food Ethics (3)
- FST 423 Food in History (3)
- NSD 555 Food, Culture and Environment (3)

****NOTE**** This has prerequisites that will add to SU credits.

Forestry Minor

Coordinator: Dr. Rene Germain

The minor in forestry draws from the biological, physical, social, and managerial sciences. The curriculum aids in understanding the biological complexities of the forest and the interactions between the forest and social and economic demands. The minor is designed to provide students with an appreciation of forest resources management. Course themes include forest measurements, forest ecology, forest management and silviculture, and forest policy and economics.

Admission to the minor requires students to have a cumulative grade point average of 2.70 or better after one semester at ESF (or as a transfer student with same standing).

The minor in Forestry requires 17 credits. It is the responsibility of the student to meet any prerequisites associated with courses in the minor. **Required courses:**

- FOR 322 Natural Resources Measurements and Sampling (3) (prerequisites: FOR 304 or equivalent and APM391 or equivalent)
- FOR 332 Forest Ecology (4) (prerequisites: FOR 232 or EFB 320 or equivalent)
- FOR 334 Silviculture (4)
- FOR 370 Forest Management Decision Making and Planning (3) (prerequisites: FOR 322 and FOR 334) or FOR 373 Forest Operations (3) (prerequisites: FOR 322 or FOR 334 or permission of instructor)
- FOR 333 Natural Resource Managerial Economics (3) (prerequisite: FOR 207 or equivalent) or FOR 465 Natural Resources Policy (3)

Information Management and Technology Minor

Coordinator: Zora Thomova

In collaboration with the Syracuse University School of Information Studies (the i-School), ESF also offers an undergraduate minor in Information Management and Technology for ESF students. This minor is designed to give students knowledge of information technology and an understanding of information and communications problems. It complements many majors because all organizations need people who understand information resources and information technology. To be eligible for this minor, students must have a cumulative grade point average of 2.70 or better and apply for the minor after completing at least one semester at ESF, but as soon after that as possible to ensure all courses can be completed. It is preferable students begin the minor during their sophomore year.

The following 18 credits of courses are required: ITS 195 Information Technologies (3); 9 credits of ITS elective coursework; and one course from each of the following two general areas of study:

Technology:

- IST 233 Introduction to Computer Networking (3)
- IST 352 Applications of Information Systems (3)
- IST 459 Introduction to Database Management Systems (3)

Management:

- IST 335 Introduction to Information-based Organizations (3)
- IST 352 Information Analysis of Organizational Systems (3)
- IST 445 Managing Information Systems Projects (3)

For questions regarding the selection of elective coursework, please contact Elaine Morgan with the i-School at 443-1830 or emmorgan@syr.edu

Landscape Architecture Studies

The minor in Landscape Architecture Studies provides an understanding of the natural and human factors and the role of design in shaping our physical environment. This minor is available to SU and ESF students. To complete this minor, students must complete 15 credit hours (5 courses) with a cumulative grade point average of 2.5. One course is specified, with an additional four courses to be selected from the list of seven approved courses listed below.

Admission to the minor requires a cumulative grade point average of 2.7 or higher and permission (ESF petition) of the Landscape Architecture Undergraduate Curriculum Director (331 Marshall Hall).

Required Courses (3 Credits)

- LSA 220 - Introduction to Landscape Architecture

Approved Courses (3 Credits each)

- LSA 311 - Natural Processes in Planning and Design
- LSA 312 - Place/Culture/Design
- LSA 305 - History of Landscape Architecture I (meets Gen Ed)
- LSA 306 - History of Landscape Architecture II
- LSA 321 - Ecological Applications in Planning and Design
- LSA 451 - Comprehensive Land Planning
- LSA 497 - Contemporary Issues in Landscape Architecture

Total credits required: 15

Management Minor

Coordinator: Dr. René Germain

The management minor is available to all ESF undergraduate students who want to develop greater skills and knowledge of business fundamentals. In addition to understanding basic financial and managerial accounting principles, students can further develop focus in their minor through coursework in entrepreneurship, finance, marketing, human resources, and other topics.

Admission to the minor requires sophomore status, a cumulative grade point average of 2.70 or better and permission (via the ESF Minor Enrollment Form) of the Coordinator of the minor. Normally, students are allowed to take only one management course at Syracuse University's Whitman School per semester, so careful planning is required.

The management minor requires fifteen (15) credits, six (6) credits from a required course and nine (9) credits of elective courses. It is the responsibility of the student to meet any prerequisites associated with any courses in the minor.

Required Courses (6 credits)

Course Number	Course	Codes *	Credits
FOR 360 AND FOR 205	Principles of Mgmt/ Envrn Prof Principles of Accounting		3 3

Elective Courses (9 credits)

Course Number	Course	Codes *	Credits
CME 444	Materials Marketing		3
EST 450	Sustainable Enterprise		3
FOR 485	Business and Managerial Law		3
PSE 456	Management in Industry		3

SRE 422	Energy Markets and Regulation		3
SRE 454	Sustainable Energy Fin&Analysis		3

SU courses

Course Number	Course	Codes *	Credits
EEE 370	Intro To EEE		3
EEE 375	Entrepreneurial Family Bus. Mgmt.		3
EEE 382	Entrepreneurial Marketing		3
EEE 442	Emerging Enterprise Law		3
EEE 443	Emerging Enterprise Consulting		3
FIN 301	Essentials of Finance		3
MAR 301	Essentials of Marketing		3
SHR 247	Introduction to Strategic Mgmt.		3

*Students in the Sustainable Energy Management major may not use SRE 422 and SRE 454 to satisfy the requirements in the Management minor.

Marine Science Minor

Coordinator: Dr. Kim Schulz

The marine science minor is available to students in all majors who want to increase their knowledge of marine systems. Prior to admission students must have completed one year of General Biology (EFB 101/102 and EFB 103/104) and one year of General Chemistry (FCH 150/151), or equivalent, and have earned a cumulative GPA of 2.70. Some of the directed elective courses have additional pre-requisites, which will not count toward the minor.

Courses:

This minor requires at least 12 credits from the list below, with no more than 3 courses taken from any one department, and no more than 3 credit hours of lower division credits counted. Other marine science courses may be substituted by petition for any course in the directed elective list with approval of the marine science curriculum coordinator.

Although not required, all participants in the marine science minor are encouraged to incorporate a field or hands-on component in their choice of courses. Such courses may include the Sea Education Association courses, approved field courses from other marine stations or institutions, an approved internship (e.g., EFB 420) or approved independent research (e.g., EFB 498, ENS 498, FCH 498) opportunities related to marine topics (must be approved in advance by the marine science minor coordinator) or other marine field courses approved by the minor coordinator.

Directed Electives

Course Number	Course	Codes *	Credits
EFB 355	Invertebrate Zoology		4
EFB 423	Marine Ecology		4
EFB 486	Ichthyology		3
EFB 487	Fisheries Science & Mgt		3
FCH 520	Marine Biogeochemistry		3
FCH 525	Oceanography		3
BIO 100	Ocean Life		3
EAR 117	Oceanography		3
EAR 205	Water & Our Environment		3
EAR 210	Hist of Earth and Life		3
EAR 325	Introduction to Paleobiology		4
EAR 429	Topics in Paleobiology		3
EAR 432	Seafloor Spreading&Oceanographic Lithosphere		3
EAR 544	Quaternary Environment&Climate Change		3
GEO 327	Geography of Coastal Environments		3

In addition, the following Sea Education Association courses would count toward the minor without petition, and not subject to the lower division requirement described above (221 Oceanography, 224 Practical Oceanographic Research, 225 Practical Oceanography I, 226 Practical Oceanography II, 320 Ocean Science and Public Policy, 321 Oceans in the Global Carbon Cycle, 324 Advanced Oceanographic Field Methods, 325 Directed Oceanographic Research, 326 The

Ocean and Global Change, 327 Toward a Sustainable Ocean: Conservation and Management, 450 Advanced Topics in Biological Oceanography: Biodiversity).

Mathematics Minor

Coordinator: Dr. Gary Scott

The mathematics minor is available to all ESF undergraduates who have an interest in developing greater knowledge in the field of mathematics. To be eligible for this minor, a student must have a cumulative grade point average of 2.700 or better by the end of the sophomore year. Interested students must submit a minor enrollment form to their academic advisor and the minor coordinator. Twenty one credit hours (6 courses) in mathematics courses are required to complete the minor. Admission to the mathematics minor requires students to have completed Calculus I and Calculus II.

Required Courses: (15 credits)

- APM 205: Calculus for Science and Engineering (4)
- APM 206: Calculus for Science and Engineering II (4)
- APM 307: Multivariable Calculus (4)
- Choice of:
 - APM 485: Differential Equations for Engineers and Scientists (3)
 - MAT 331: First Course in Linear Algebra (3)

Elective Courses: (6 credits)

- ERE 465: Environmental Systems Engineering (3)
- ERE 533 Ecological Modeling (3)
- APM 391 Introduction to Probability and Statistics (3)
- APM 395 Probability and Statistics for Engineers (3)
- APM 485 Differential Equations for Engineers and Scientists (3)
- APM 510 Statistical Analysis (3)
- APM 585 Partial Differential Equations for Engineers and Scientists (3)
- APM 595 Probability and Statistics for Engineers (3)
- APM 620 Experimental Design and ANOVA (3)
- APM 625 Sampling Methods (3)
- APM 630 Regression Analysis (3)
- APM 635 Multivariate Statistical Methods (3)
- APM 645 Nonparametric Statistics and Categorical Data Analysis (3)
- APM 730 Adv Regression Modeling Methods (3)
- MAT 3xx/4xx/MAT 5xx Any MAT course numbered 300 or above (3)

Microscopy Minor

Coordinator:

The microscopy minor is available to all undergraduates at ESF and Syracuse University, who desire knowledge of methods and applications of light and electron microscopes for research and industry. The minor will prepare students to use a variety of microscopes for applications in biology, nanotechnology, environmental medicine, chemistry, materials science, engineering, pulp and paper and others.

Admission requires junior status and GPA 2.75. To enroll in the minor, students must submit a petition to their advisor, the undergraduate curriculum coordinator in their home department,

and the minor coordinator in the NC Brown Center for Ultrastructure Studies in the SCME department with final approval by the Dean of Instruction.

The minor requires 12 credits of coursework:

Required courses

Course Number	Course	Codes *	Credits
MCR 480	Fundamentals of Microscopy		3
MCR 484	Scanning Electron Microscopy		3
MCR 485	Trans Electron Microscopy		3
MCR 585	Light Microscopy/ Rsrch Appl		3

Native Peoples and the Environment Minor

Coordinator: Dr. Madeline Nyblade

The Native Peoples and the Environment minor is available to all ESF undergraduates. The interdisciplinary suite of courses provides students with a cohesive introduction to Indigenous cultures, worldviews and knowledge systems and their application to environmental thought. The minor creates a conceptual framework for integrating traditional ecological knowledge with western scientific approaches in service to the science of sustainability. Through the breadth of courses and experiences, students will gain an appreciation for both the global nature and the local context of indigenous issues and the environment. The minor includes a required team taught seminar which enhances opportunities for interdisciplinary and cross-cultural integration.

Fourteen credit hours (5 courses) taken in residence are required to complete the minor. Two courses are specified, with an additional two or three courses selected from the list below. An internship may be used to fulfill a course requirement, if focused on Native peoples and the environment

Admission to the minor requires sophomore status with a cumulative GPA of 2.70 or better. Fourteen credit hours of courses are required.

Required Courses (6 credits)

Course Number	Course	Codes *	Credits
EST 140	Int/Native People, Land, Cult		3
EFB 305	Indigenous Issues&the Envrmnt		3

Two or three courses (8 credits) selected from the following list

Courses

Course Number	Course	Codes *	Credits
EFB 306	Wildlife Field Techniques		3
EFB 337	Field Ethnobotany		3
EST 390	Social Processes & Envrn		3
EST 497	Onondaga Land Rights&our common Future		3
SOC 444	Contemporary Native American Movements		3
NAT 142	Native American Religion		3
NAT 400	Selected Topics		3
EFB 420	Prof Internship/Envrn Biology		1 - 5
EFB 496	Topics/Envrn&Forest Bio		1 - 3
EFB 496	Topics/Envrn&Forest Bio		1 - 3
EFB 496	Topics/Envrn&Forest Bio		1 - 3

Relevant 496 and 497 courses may be acceptable for inclusion in the minor, by petition to the minor coordinator.

Paper Science Minor

Coordinator:Dr. Gary Scott

The paper and related industries (including pulp, mineral, chemical and machinery suppliers) continually seek knowledgeable and skilled employees. Each year, companies hire numerous graduates of chemical, mechanical and environmental engineering programs as well as chemists and other environmental professionals in addition to paper science and engineering graduates. Salaries for new hires are among the highest for all fields of study at the bachelor's degree level. This minor gives students a basic understanding of the paper industry that will allow them to apply their major field of study to this growth industry. The paper engineering minor is available to all ESF undergraduate students (except students in paper engineering programs) who maintain a minimum cumulative grade point average of 2.70. Waivers to prerequisites of courses will be favorably considered in increase access to the minor across campus. Fifteen credit hours in paper science courses are required.

Required courses (4 credits)

- PSE 200 Introduction to Papermaking (3)
- PSE 202 Pulp and Paper Laboratory Skills (1)

Directed Electives Courses (11 Credits)

- ECH 202 Principles of Mass and Energy Balance (3)
- PSE 201 The Art and Early History of Papermaking (3)
- PSE 223 Introduction to Lignocellulosics (4)
- PSE 304 Professional Internship (1)
- PSE 305 Professional Co-op (1)
- PSE 306 Professional Synthesis (1)
- PSE 350 Fiber Processing (3)
- PSE 436 Pulp and Paper Unit Operations (3);
- PSE 437 Equipment Troubleshooting and Maintenance (3)
- PSE 438 Biorenewable fibrous and nonfibrous products (3)
- PSE 450 Pulping and Bleaching Processes (3)
- PSE 456 Management in Industry (3)
- PSE 462 Papermaking Processes I (3)
- PSE 465 Fiber and Paper Properties (4)
- PSE 466 Paper Pigment and Barrier Coating (3)
- PSE 467 Papermaking Wet End Chemistry (3)
- PSE 469 Functional and Nano Additives (3)
- PSE 478 Papermaking Processes II (2)
- PSE 481 Engineering Design (3)
- PSE 552 Fiber Materials Recycling and Processing (3)
- RMS 200 Renewable Materials and Composites from Lignocellulosics (3)
- RMS 335 Transport Properties of Materials (3)
- RMS 388 Wood and Fiber Identification Laboratory (2)
- RMS 465 Renewable Materials and Surfaces: Testing (3)

Physics Minor**Coordinator: Dr. Gary Scott**

The physics minor is available to all ESF undergraduates who have an interest in developing greater knowledge in the field of physics. To be eligible for this minor, a student must have a cumulative grade point average of 2.7000 or better by the end of the sophomore year. Interested students must submit a minor enrollment form to their academic advisor and the minor coordinator for approval.

Twenty hours (8 courses) in physics courses are required to complete the minor. Admission to the physics minor requires students to have completed General Physics I (with lab).

Required Courses: (8 credits)

PHY 211 General Physics I (3) or PHY 215 General Physics I for Scientists (3)
PHY 212 General Physics II (3) or PHY 216: General Physics II for Scientists (3)
PHY 221 General Physics I Laboratory (1)
PHY 222 General Physics Laboratory II (1)

Elective Courses: (12 credits)

Any PHY courses numbered 300 or above

Public Health Minor**Coordinator: Dr. Lee Newman**

The Public Health minor will be available to students in all majors who want to increase their knowledge of the impact of public health issues and administration on human and human population health. Some of the directed elective courses have additional pre-requisites, and students must investigate this before making up their proposed course plan.

Interested students (GPA 2.7 required in order to apply) must submit a petition, with a list of potential courses to fulfill the minor requirements to (a) their faculty advisor, (b) the undergraduate curriculum coordinator of their home department and (c) the public health minor coordinator, with final approval from the Dean of Instruction and Graduate Studies. Many of these courses are offered at Syracuse University.

Three Required Courses

Course Number	Course	Codes *	Credits
EFB 360	Epidemiology		3
PHP 221	Community Health Promotion		3
PHP 309	Health Disparities		3

Select three among the following courses

Course Number	Course	Codes *	Credits
EHS 350	Environmental Health Managemnt		3
FST 403	Right to Food and Nutrition		3
PHP 302	Influencing Healthy Behavior		3
PHP 305	Community Mental Health		3
PHP 313	Issues Challenges Healthcare		3
PHP 306	Understanding Health Systems		3
PHP 414	Ethics & Law Hlthcare Adm		3
PHP 415	Public Health Ethics		3
PHP 436	Ethics in Addiction Services		3
PHP 437	LGBTQ Health and Well Being		3

PHP 438	Native American Health Promotion		3
PHP 462	Culture&Reprod Health&Med		3
PHP 463	Global Health		3

Recreation Resource and Protected Area Management Minor

Coordinator: Danielle Kloster

This minor provides students with the opportunity to combine visitor management with protected area management. Understanding the need to balance the opportunity for visitor experiences with protecting and stewarding protected areas provides professional insight into planning and managing those areas for limited visitor access. Understanding the motivations, preferences, and behavior of recreational users is necessary to integrate the human dimensions into protected area management with consideration of the social and environmental factors related to such management. Protected area managers need to be able to manage both the resource itself as well as a wide variety of users, such as campers, hikers, bird watchers, boaters, nature photographers and others who enjoy nature-based experiences in extensive protected area environments owned by public agencies, private landowners, or NGOs.

Students from all programs at ESF are eligible for this minor if they have completed a general ecology course and have a cumulative grade point average of 2.70 or better in their major program of study after one semester at ESF (or as a transfer student with same standing). Overlap between the minor and both one required course and one directed elective for a student's major is permitted; other courses taken for the minor can not overlap with the major.

This interdisciplinary minor requires 15 credits and includes the following courses taught at ESF in the Departments of Forest and Natural Resources Management and Environmental and Forest Biology:

Required Courses (9 credits)

Course Number	Course	Codes *	Credits
EST 370	Intro/Pers Env Interp Methods		3
FOR 372	Fund/Outdoor Recreation		3
FOR 475	Recreation Behavior &Managemnt		3

Required independent study or internship (3 credits)

Course Number	Course	Codes *	Credits
FOR 498 SECTION 20 OR			3 3

FOR 499 SECTION 20			
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One of the following management/protected area courses (3 credits)

Management/Protected Area Courses (3 credits)

Course Number	Course	Codes *	Credits
EFB 413	Intro To Conservation Bio		3
FOR 404	Ecotourism Abroad		3
FOR 476	Ecotourism and Nature Tourism		3
FOR 478	Wilderness & Wildlands Mgt		3
FOR 523	Tropical Ecology		3

Renewable Energy Minor

Coordinator: Dr. Tim Volk

The development of sustainable sources of energy has become a critical national and global issue due to concerns about the quality and quantity of the different potential resources, energy security, and potential impacts of each on the environment and human health. It is essential that our society and energy professionals understand the production and conversion of different forms of energy, their current and future supplies, the markets and policy mechanisms that regulate their supply, and the associated impacts on the environment for each fuel. In the past both traditional and renewable energy sources have been studied one resource at a time and usually from the perspective of a single discipline. This minor provides students an opportunity to examine different sources of traditional and renewable energy simultaneously in the context of our total energy use using a systems perspective. Students are exposed to views from a variety of disciplines which allows them to consider a wide array of issues related to current and future energy supply and use.

The Renewable Energy minor is available to all ESF and Syracuse University undergraduate students (except students who are in the Sustainable Energy Management Major and Environmental Science's Renewable Energy option) who have a GPA of 2.70 or better by the end of their sophomore year. The minor requires a minimum of 15 credits, 12 of which are required courses. The remaining 3 credits can be selected from a list of suggested courses.

Required Courses

Course Number	Course	Codes *	Credits
SRE 325	Energy Systems		3
SRE 337	Energy Resources Assessment		3

SRE 479	Life Cycle Assessment		3
CME 305 OR SRE 441	Sustainable Energy Sys/Bldgs Biomass Energy		3 3

Suggested Courses

(other courses may be used to meet this requirement with approval of minor coordinator)

Course Number	Course	Codes *	Credits
CME 305 OR SRE 441	Sustainable Energy Sys/Bldgs Biomass Energy		3 3
ECH 202	Principles of Mass and Energy Balance		3
ECH 212	Engineering Thermodynamics		3
ERE 380	Energy Systems Engineering		3
EST 427	Environmental and Energy Auditing		3
FCH 360	Physical Chemistry I		3
SRE 416	Sustainable Energy Policy		3
SRE 422	Energy Markets and Regulation		3
SRE 454	Sustainable Energy Fin&Analysis		3
SRE 481	Advanced Life Cycle Assessment		3

Sustainable Construction Minor

Coordinators: Dr. Endong Wang

The sustainable construction minor is available to all ESF undergraduates (except students in construction management) and prepares students for careers related to sustainable construction. The objective of the minor is to provide a fundamental understanding of the concepts and methods used to take a design into the field and build a quality sustainable structure in the most efficient and effective manner with minimal environmental impact. Admission to the minor requires sophomore status and a cumulative grade point average of 2.70 or higher.

A cumulative grade point average of 2.000 or higher is required for the sustainable construction management courses in order to obtain the minor.

Fifteen credit hours are required to complete satisfy the minor. Choose 5 courses (15 credits) from the following:

Course Number	Course	Codes *	Credits
CME 215	Sustainable Construction		3
CME 305	Sustainable Energy Sys/Bldgs		3
CME 306	Engr Materials/ Sustainable Cons		3
CME 343	Construction Estimating		3
CME 405	Bldg Info Modelng/ Cons Mgt		3
CME 444	Materials Marketing		3
CME 453	Construct Plan/ Scheduling		3
CME 454	Construction Project Mgt		3
EST 426	Community Plng&Sustainability		3
EST 427	Environmental &Energy Auditing		3
EST 460	Land Use Law		3
EST 550	Envrn Impact Analysis		3
RMS 387	Renewable Mat/ Sustainable Cons		3
RMS 422	Composite Mat/ Sustainable Cons		3

Urban Environmental Science Minor

Coordinator: Dr. Margaret Bryant

Twelve credit hours (4 courses) of urban concentration courses are required to satisfy the minor: 6 credits of required courses and 6 credits of electives outside the student's major. Entry into the minor requires a minimum cumulative GPA of 2.70 in residence at ESF.

Core Course Requirements

To satisfy the Minor in Urban Environmental Science, the student must take the following core courses:

Core courses

Course Number	Course	Expected time of completion (Semester/Year)	Credits
EST 220 OR EFB 220	Urban Ecology Urban Ecology	offered Autum	3 3

and three credits of a "Capstone" project accomplished from among the following:

Capstone

Course Number	Course	Codes *	Credits
XXX 496	Approved 'experimental' course		3
XXX 498	Approved Independent Research Project		3
XXX 499	Approved Internship		3
ESTABLISHED COURSE	Approved Course		3

A student enrolled in the minor, will present to the advisory committee in the sixth week of the semester prior to engagement in the learning endeavor, a plan for a "capstone" experience, which will be undertaken working in conjunction with a faculty member(s) who will oversee an off-campus internship (courses numbered 499), independent-study project (courses numbered 498), or completion of a final project undertaken in a special topic (courses numbered 496) or established 3-credit course. All students will present their completed projects to the advisory committee and their peers in the last week of classes, depending on the semester of completion (fall or spring). All students currently enrolled in the minor are expected to attend capstone presentations.

Elective Course Requirements

Outside the student's Major, 6 additional credits selected from the list of approved courses, which are offered in a faculty other than that of the student's major, and which are above and beyond those courses being used to satisfy a student's major, general education or professional requirements.

Urban Forestry Minor

Coordinator: Dr. Deborah Hilbert

The Urban Forestry minor will provide students with the opportunity to better understand complex human-dominated ecosystems where trees and people coexist in close proximity. Understanding and attempting to manage this complexity requires a basic knowledge of plant physiology, nutrition, and tending at the individual tree level (arboriculture). In addition, the urban forester also must understand the changing dynamic of groups of trees and the effects of those trees on numerous ecosystem services and human health and well-being in a city (urban forestry). Because human activity is so dominant in the urban ecosystem, it is essential that the urban forester have some understanding of ecological interactions and human motivations for sustaining and maintaining existing trees (urban ecology). The courses listed below will provide the professional knowledge required for careers in these and related fields.

The Urban Forestry minor requires fifteen (15) credit hours, nine (9) credits from the required courses and six (6) additional credits from the directed elective courses. It is the responsibility of the student to meet any prerequisites associated with any courses in the minor.

Courses

Course Number	Course	Codes *	Credits
ESF 300	Intro/Geospatial Info Tech		3
FOR 480	Urban Forestry		3
FOR 481	Introduction to Arboriculture		3

Course Number	Course	Codes *	Credits
EFB 336	Dendrology		3
EFB 351	Forest Entomology		3
EFB 502	Ecology & Mgt of Invasive Species		3
EST 220	Urban Ecology		3
EST 353	Behavior Change and the Environment		3
EST 415	Environmental Justice		3
EST 426	Community Planning and Sustainability		3
FOR 313	Tree Structure and Function		3
LSA 451	Comprehensive Land Planning		3
LSA 480	Seminar:Urban Design		3

SUS 310	Human & Social Dimensions of Sustainability		3
SUS 410	Sustainable Urbanism		3

The interdisciplinary minor includes courses taught in the Departments of Forest and Natural Resources Management, Environmental Studies, and Landscape Architecture. Admission to this minor requires students to have (1) completed a general ecology course (e.g. EFB 320 General Ecology, FOR 232 Natural Resources Ecology, FOR 332 Forest Ecology, or EFB 445 Plant Ecology & Global Change), and (2) a cumulative grade point average of 2.70 or greater after one semester at ESF (or as a transfer student with the same GPA).

Water Resources Minor

Coordinators: Dr. Kim Schulz (EB) and Dr. Chuck Kroll (ERE)

Water resources is a multi-disciplinary field that integrates the physical, geochemical and biological processes of the water cycle and their application to management of water resources, water policy, and human dimensions of water quality and quantity. The interdisciplinary minor in water resources is designed as a flexible program for undergraduate students to study and integrate principles of physical hydrology, geochemistry, aquatic and terrestrial ecology, natural resources management, and environmental policy. The minor can include courses in the Departments of Forest and Natural Resources Management, Environmental Resources Engineering, Environmental and Forest Biology, Chemistry, and Environmental Studies, as well as relevant courses at Syracuse University. The minor comprises 15 credit hours total that must be distributed across three departments at minimum (i.e., course numbers with three separate prefixes), with the intent of covering a breadth of disciplines. These courses must include at least one foundation course, either FOR 442 Watershed Ecology and Management, or EFB 424 Limnology: Study of Inland Waters. Courses taken for the minor can also count toward students' majors or other academic requirements, subject to those other program guidelines. Students are responsible for meeting the prerequisite requirements for individual courses, as applicable.

Admission to this minor requires that a student from any ESF program has a cumulative grade point average of 2.70 or better after one semester at ESF (or as a transfer student with same GPA).

Required foundation course; students must take at least one of these:

Required Courses

Course Number	Course	Codes *	Credits
FOR 442	Watershed Ecology & Management		3
EFB 424	Limnology: Study of Inland Waters		3

Approved elective courses that count toward the minor include the following, subject to availability and pre-requisite requirements. Other relevant courses may be petitioned. Note that some ERE elective courses may require prerequisites, such as calculus, chemistry, and

programming; students who are interested in these courses should consider taking the engineering sections of their calculus sequence.

Fall Courses

Course Number	Course	Codes *	Credits
EFB 487	Fisheries Science & Mgt		3
EFB 488	Fisheries Science Practicum		1
EFB 496	Topics/Envrn&Forest Bio		1 - 3
EFB 500	Forest Biology Field Trip		1 - 3
EFB 525	Limnology Practicum		2
EFB 681	Aquatc Ecosys Restore/Enhance		2
ENS 601	Water Resources Mgt		3
ENS 607	Wetland Practicum		2 - 3
ERE 412	River Form and Process		3
ERE 475	Ecological Engr/Water Quality		3
ERE 527	Stormwater Management		3
EST 625	Wetland Management Policy		3
FCH 515	Meth/Envrn Chem Analysis		3
FOR 338	Meteorology		3

Spring Courses

Course Number	Course	Codes *	Credits
EFB 423	Marine Ecology		4
EFB 486	Ichthyology		3
EFB 492	Sr Synthesis/ Aquatic&Fish Sci		1

EFB 542	Freshwater Wetland Ecosys		3
EFB 692	Ecol And Mgt Of Waterfowl		3
ERE 340	Engr Hydrology&Hydraulics		4
ERE 440	Water and Wastewater Treatment		3
ERE 445	Hydrologic Modeling		3
ERE 508	Water-An Incredible Journey		3
ERE 570	Hydrology in a Chng Climate		3
FCH 510	Environmental Chemistry I		3
FCH 525	Oceanography		3
FOR 340	Watershed Hydrology		3

Approved Syracuse University courses

Course Number	Course	Codes *	Credits
CIE 352	Water Resources Engineering		3
CIE 457	Biogeochemistry		3
EAR 400	Selected Topics		3
EAR 400	Selected Topics		3
EAR 401 OR EAR 601	Hydrogeology Hydrogeology		3 3
EAR 612	Water-Energy Seminar		3
GEO 316	River Environments		3
GEO 422	Water: Env, Soc & Po		3

SPECIAL ACADEMIC OPTIONS

Honors Programs

At SUNY College of Environmental Science and Forestry, the Honors program helps students build relationships and is an excellent way to enhance the college experience. The Honors Program provides students in all academic majors with value-added educational experiences. Academic components of the program strengthen exploration and communication skills. Students complete intensive scholarship with faculty through their Honors Thesis.

Honors Students share their Honors Program experience with each other through Honors seminars and social events. They translate their academic skills into leadership roles in student government, clubs, or community service. Honors Students receive early registration privileges and access to honors sections of courses offered at Syracuse University and ESF.

Students who successfully complete all requirements of the Honors Program receive honors medals that are worn to the College's Commencement ceremonies and recognition on their college transcript that they graduated with Honors.

Admissions to the Honors Program

Admission to the program is extremely selective. Primary consideration is given to a student's academic record with a high school grade point average of 95% or higher, and high school class rank in the top 10% (where rankings are available). Honors Students are expected to be well-rounded with considerable contribution to extra-curricular activities and community service. Please note that these are minimum requirements and that the typical student admitted to Honors exceeds these requirements. The College generally admits no more than 40 first-year students to the program each year. As a result, qualified students may not receive an initial invitation but will be invited, or may apply, later in their college careers.

Exceptionally qualified students who have completed one year at ESF may receive an invitation to join the Honors Program. Any student with a GPA of greater than 3.5 who is completing research with a faculty mentor may apply to the Honors Program. Eligible and interested students may also contact the Directors of the Honors Program or their department's representative to the Honors Program Advisor Council to apply to the Honors Program.

Program Requirements

Honors Students must complete the following coursework:

- ESF 109 or ESF 209 Honors Program Seminar
- Two courses that contribute directly to the Honors thesis. These courses must be at the 400 level or above. Students in the ESF Honors Program may enroll in 600 level with permission of the instructor.
- A total of 6 credits of honors thesis credit (ESF 499) with a grade of B or better or similar research credits that are department specific (e.g., EFB 498).

Honors Students must supplement their work with a presentation of their research at a scholarly venue. This presentation could be at the ESF Spotlight on Student Research. Many students satisfy this requirement through presentations at regional, national or international scientific meetings.

Honors students are expected to maintain a cumulative GPA of 3.2 or higher.

The Honors Thesis

The Honors Program provides the opportunity for students to complete intensive research and creative projects under the guidance of ESF's world-class faculty. This scholarship emphasizes and encourages holistic and multidisciplinary awareness of the problems and opportunities in studying and working with the natural and built environments. The subject matter and type of thesis is left open to the students and their advisors.

All ESF Honors Theses are uploaded to the Experts at ESF where they become available throughout the world. Many Honors Students publish their work in scholarly journals.

Honors Students are eligible for thesis enhancement grants (up to \$1000) to support their Honors thesis work.

Honors Program Advisory Council

The Honors Advisory Council (HPAC) recommends policies and serve as advocates for the Honors Program to prospective students and the college, provide oversight for thesis and program standards, and make recommendations for admission to the Honors Program.

Education and Study Abroad

SUNY ESF is committed to enhancing the internationalization of ESF students' academic experiences. ESF believes strongly that international experiences provide students with the opportunity to develop the skills necessary to be informed, active, responsible, and culturally-sensitive global citizens.

International programs range from short-term opportunities (1-2 weeks) to longer-term opportunities (1-2 semesters). Students are also eligible to study and/or research abroad on every continent and in 100+ countries. The Office of International Education is equally determined to make study abroad accessible to all despite financial, academic, or other person concerns. There is a program for everyone at ESF. For more information, check out the [Education Abroad website](#) or email OIE at oie@esf.edu.

Pre-professional Advising

Medical and Health Professions (medicine, dentistry, optometry & veterinary medicine)

ESF students interested in medicine (MD, MD/ PhD, Physician's Assistant, Nurse Practitioner or Registered Nurse), dentistry, optometry, physical therapy, and veterinary medicine are encouraged to identify themselves to the ESF Pre-Health Coordinator who can then assist them in exploring these pathways, including choosing the right major while at ESF, advising them on academic qualifications and preparing for the application process.

Entering ESF students interested in the health professions may participate in the Pre-Health sessions offered during Open House events, which allows them to meet with current Pre-Health students and helps incoming students to decide on the right major for their career path. Depending on the chosen path, suitable majors might be Environmental Biology, Biotechnology,

Biochemistry, Environmental Science or Environmental Health. Once students select their major, they will be paired with academic advisors who have expertise in advising Pre-Health students.

Law

ESF offers pre-professional advising to students interested in pursuing law as a profession.

Unlike some other professional programs, law schools do not require or recommend a specific program of study or specific coursework. Instead, the Law School Admissions Council advises students who are interested in the legal profession to pursue undergraduate education that demonstrates success in intellectually challenging curricula that enhance students' critical thinking skills.

Combined Degree Program with Upstate Medical University

SUNY Upstate Medical University (UMU) and ESF partner on a program providing access to a health-related combined degree.

The 3+3 Early Assurance for the Doctor of Physical Therapy (DPT) program allows students to complete both their undergraduate degree at ESF and their physical therapy doctoral degree at UMU in SIX years rather than seven years. The first year at UMU counts for both the fourth year of the bachelor's degree and the first year of the DPT.

This program is only available to first year applicants and has strict application deadlines. Applications to both ESF and UMU must be completed during the fall of the senior year. Visit each college's website for more information on this program.

GRADUATE STUDY: DEGREES AND OPTIONS

Graduate academic programs at ESF share a foundation of rigorous science and dedication to wise use of natural resources. ESF offers advanced degrees in six program areas. Each program provides a unique opportunity for you to further your education with professors who are dedicated to both their teaching and research endeavors.

Ecosystems all over the world benefit from the professionalism and expertise of ESF graduates and the faculty members at the College of Environmental Science and Forestry. You will study with professors whose work improves and sustains the environment from the Yucatan Peninsula to Alaska and whose expertise is sought by government and corporations. That same faculty will be personally concerned with your progress. The professors' cutting-edge research will become part of your classes, and your classes will merge with the world beyond the College.

Degree Programs

ESF is authorized by the New York State Department of Education to offer undergraduate and graduate degree programs as described in this catalog. The Higher Education General Information Survey (HEGIS) code is the number assigned to programs registered by the commissioner of the New York State Department of Education. The Classification of Instructional Programs (CIP) Code allows the U.S. Department of Education to track educational programs for financial aid eligibility. Enrollment in programs that are not registered or otherwise approved may jeopardize a student's eligibility for certain financial aid programs.

Areas of Study

The general area of study for each master's or doctoral student is implied by the title of the program in which the degree is awarded. Areas of study may be established within degree programs by individual departments that further define the student's area of specialization. The student's area of study is listed on the student's transcript if identified on the study plan.

Additionally, each department may offer minors identifying ancillary areas of study that may be appropriate for the degree program. A minor is equivalent to 12 or more graduate credits earned in the minor area. Courses in a minor area must be taken outside of the student's area of study. A minor is identified on the student's transcript. A minor professor must be appointed to the student's steering committee for each minor elected, in addition to the minimum complement of steering committee members. Each minor professor can replace an additional examiner.

Graduate Degrees

Ph.D., M.S., M.P.S., M.L.A. & M.F.

Four master's degrees are offered at ESF—master of science, master of forestry, master of landscape architecture, and master of professional studies—as well as the doctor of philosophy degree. The following section describes the requirements for graduate degree programs offered by the College.

Master of Forestry (M.F.)

The Master of Forestry (MF) graduate degree program enables students to integrate knowledge and expertise drawn from both the natural and social sciences, and to apply their knowledge to solve practical forest management problems.

The primary focus of the program is to provide an opportunity for graduates coming from diverse academic backgrounds with non-forestry baccalaureates to gain a professional education in forestry. As such, the program is designed to be the first professional degree in forestry attained by a student. Graduates will successfully function as professional foresters on multi-disciplinary forest management teams and respond to the challenges related to the sustainable management of local, regional, and global forest resources.

The degree requires 37 graduate credits of coursework, of which at least 24 must be taken in residence at ESF. The degree accredited as a professional forestry program by the Society of American Foresters under Forestry.

The program is open to both students with some prior background in forestry and natural resources, and for those without such background. More than four (4) semesters may be required for students from non-science backgrounds who need additional basic undergraduate coursework as part of their degree program. The MF program is designed for May admission to accommodate a 4-week summer field course.

Master of Landscape Architecture (M.L.A.)

Graduate studies in landscape architecture attract a broad range of people. Those with undergraduate degrees in landscape architecture may seek specialization within the profession, advanced exploration or an academic career. Others, with degrees in related fields such as architecture, city and regional planning, and environmental design, enter the program to broaden or redirect their design and planning skills. Some students with degrees in fields less closely related (such as humanities or arts and sciences) seek new career options or to focus prior interests through a licensed design and planning profession.

The degree is accredited by the Landscape Architectural Accreditation Board (LAAB).

A three-year program for applicants who have no design or planning background leads to the fully accredited professional degree of master of landscape architecture (M.L.A.). This program is for students who intend to complete coursework full time. Applicants with a related design or planning degree may enter the three-year program with advanced standing.

The M.L.A. program, for the student seeking a first professional degree in landscape architecture, is a more tightly structured curriculum because it leads to the prerequisite work experience that qualifies the graduate for the Landscape Architecture Registration Examination (L.A.R.E.).

Master of Professional Studies (M.P.S.)

www.esf.edu/graduate/programs/mps.php

The Master of Professional Studies (M.P.S.) degree is intended to be a terminal degree. The M.P.S. is offered in the following degree programs: chemistry, environmental and forest biology, forest resources management, environmental resources engineering, environmental science, and environmental studies.

This degree requires the successful completion of a minimum of 30 credits at the graduate level, of which at least 24 must be in course work. The student's program of study must be approved by the major professor, steering committee and Department Chairperson.

In addition, individual programs may require an integrative experience such as an internship, team project and/or comprehensive examination. If an examination is required, it is developed and managed by the department responsible for the program.

Master of Science (M.S.)

The master of science (M.S.) degree is an academic degree offered in the following programs: environmental and forest chemistry, environmental and forest biology, environmental studies, forest resources management, environmental resources engineering, environmental science, and landscape architecture.

To complete this degree, in addition to completion of necessary coursework, students must investigate a problem that initiates, expands, or clarifies knowledge in the field and prepare a thesis based on this study. Students are required to define an appropriate problem for investigation; review relevant information; develop a study plan incorporating investigative techniques appropriate to the problem; implement the plan; and relate the results to theory or a body of knowledge in the field.

The minimum credit-hour requirement is the successful completion of 30 graduate credits distributed between coursework and thesis. The applicable distributions will be determined by individual departments to suit program objectives, with the understanding that a minimum of 18 credits is awarded for graduate-level coursework and a minimum of six credits is awarded for the thesis. All steering committee members should sign the student's study plan (Form 3B) before the end of the last year of the student's program. The student must successfully defend the thesis for degree completion. The thesis is prepared and bound according to college standards and submitted to Digital Commons.

Doctor of Philosophy (Ph.D.)

The doctor of philosophy (Ph.D.) degree is an academic degree offered in the following degree programs: environmental and forest chemistry, environmental and forest biology, forest resources management, environmental resources engineering, and environmental science. The doctor of philosophy degree requires a minimum of 60 graduate credits, of which 30 to 48 credits are for coursework and 12 to 30 credits are awarded for dissertation. Individual departments will determine the applicable credit hour requirements within these ranges to reflect individual program requirements and emphases. The graduate credits earned for a master's degree that are applicable to a student's doctoral study plan (Form 3B) are determined on an individual basis by the steering committee. All steering committee members should sign the 3B form before the end of the last year of the student's program. Students may not use master's thesis credits to fulfill doctoral program coursework requirements.

Students must pass the doctoral candidacy examination covering selected fields of study at least one year prior to dissertation defense and successfully defend the dissertation. The dissertation must be prepared according to college standards and submitted to Digital Commons.

Advanced (Graduate) Certificates

In addition to degree programs for matriculated students, ESF offers study towards the earning of advanced certificates for professionals in:

- Climate Sustainability Leadership
- Environmental Decision Making
- Environmental Leadership (online)
- Environmental Justice and Inequality (online)
- Science & Environmental Communication and Public Relations Management (online)

Concurrent Programs

Concurrent Programs for Syracuse University Students

The joint Juris Doctor (J.D.) and Forest and Natural Resources Management (FNRM) Master of Professional Studies (M.P.S.) degree is designed for Syracuse University students who are interested in legal careers involved with forest, natural, and environmental resources. As human demands on the environment increase, society needs attorneys who understand the economic, demographic, social, and political issues that drive resource use allocation. Students learn the complexities of managing both resources and people recognizing that resource and environmental decisions involve value-driven conflicts. The degree provides a comprehensive foundation in forest, natural, and environmental resources issues and an understanding of both biophysical and social science.

Students enrolled in the joint J.D./FNRM degree program must earn a minimum of ninety-six (96) credits at both the College of Law and ESF. The J.D. normally requires eighty-seven (87) credits, but joint-degree students must take at least seventy-two (72) Law School credits. Students can transfer fifteen (15) credits from ESF to the College of Law. The M.P.S. degree requires thirty (30) credits, a minimum of twenty-four (24) of which must be ESF courses and six (6) of which may be applied by transfer from coursework at the College of Law.

Students can apply to the joint J.D./FNRM degree program at two points: 1) simultaneously, before entering the College of Law, or 2) after completing the fall semester of study at the College of Law. Applicants applying simultaneously must complete a College of Law application and an ESF graduate application. Applicants applying after enrolling at the College of Law must complete an "internal" College of Law application and ESF graduate application.

Intra-ESF Concurrent Degree Programs

ESF graduate students may pursue formal concurrent graduate degrees in two different departments or academic units within the College.

Concurrent degrees magnify the strengths of academic program offerings within ESF. Pairing an academic degree (Ph.D. or M.S.) with a professional degree (M.L.A., M.P.S., M.F.), or pairing two professional degrees (M.L.A., M.P.S., M.F.) are attractive choices for ESF students. Please consult with individual departments for details regarding specific degree or program combinations. Concurrent degrees require a minimum of 80 percent of the credit hour requirements of each of the paired degrees. Students may apply for admission to both degrees at matriculation, or they may apply to add the second degree following completion of at least 12 credit hours of coursework with a minimum GPA of 3.5. Graduate students interested in these opportunities should contact the ESF Office of Instruction and Graduate Studies.

DEPARTMENT OF CHEMICAL ENGINEERING

Bandaru Ramarao

205 Walters Hall
315-470-6513
315-470-6945 (fax)

The academic programs in the [Department of Chemical Engineering](#) (CHE) emphasize fundamental engineering science and engineering skills pertaining to chemical engineering with specialization in the pulp, paper and allied industries, and the bioprocess and chemical industries. Programs include courses in traditional areas of applied chemistry, industrial bioprocessing/biotechnology, chemical engineering, and pulp and paper technology.

The department's educational programs at both the undergraduate and graduate levels are committed to preparing students for leadership roles in the paper and bioproducts industries. The department comprises nine distinguished faculty members who maintain research programs in a wide range of areas including biopulping, wood pulping and bleaching chemistry, paper physics and papermaking, chemical and process engineering, materials science, and surface and colloid science, among others.

BACHELOR OF SCIENCE IN BIOPROCESS ENGINEERING

The [bioprocess engineering program](#) prepares students for careers as engineers in the bioprocess or biotechnology industry filling positions that are typically filled by chemical engineers with additional training. The bioprocess engineering program seeks to educate engineers versed in the chemical engineering fields in biologics / biopharmaceutical, bioprocess, biotechnology, biochemical and bioenergy, with a focus on developing products from sustainable sources in a sustainable manner or through the applications of green chemistry. The bioprocess engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org> following the criteria of Chemical, Biochemical, Biomolecular and Similarly Named Engineering Programs since 2012 (<https://www.aiche.org/abet-accredited-universities>).

Students gain valuable experience through a capstone-design experience in which they work on significant problems in the design and implementation of new technologies. In addition, a summer internship is required of all students during which they gain valuable skills and experience in terms of technical knowledge and professional development. Both of these experiences serve to integrate the knowledge gained in their coursework with real-world work experiences commonly seen in their first positions after graduation.

The curriculum consists of a number of categories of courses. The general education component, which is required of all ESF students, broadens the students' perspectives on global and societal issues, an important component of any education. Students also take a number of courses in math and the basic sciences—chemistry, physics, and biology—to provide the background for the courses that prepare students for engineering practice. The engineering courses cover a variety of topics that are traditional for a chemical engineering program, supplemented with courses specific to bioprocess engineering. The moderate requirement of 128 credits hour allows room for students to supplement more courses at their own desire (no limitation on free electives).

Students may be admitted to the bioprocess engineering program as first-year students with appropriate science backgrounds from their high school or as transfer students at any level with accommodations for coursework requirements. Students who have the associate degree in engineering science, chemical technology, biological sciences, or general science and mathematics are encouraged to apply as transfer students.

Lower Division Required Courses

APM 205

APM 206

APM 307

APM 485

ECH 132

ECH 133

BPE 300

EFB 103

EFB 104

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FOR 207

GNE 160

PHY 211	3
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PHY 221	1
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PHY 212	3
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PHY 222

1

ECH 202

ECH 212

General Education Electives

Course Name	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses
APM 395

Professional Experience: BPE 498

BPE 304 + BPE 306

ECH 312

ECH 322

BPE 321

ECH 323

BPE 420

BPE 421

BPE 440

BPE 450

BPE 481

ESF 200

EWP 444

ECH 324

ECH 355

ECH 371

EFB 325

*Professional experience: BPE304 must be taken in the summer + BPE306 in the after right after, while BPE498 can be taken in any semester.

Directed Electives

13 credits out of the following.

Course Name	Codes*	Credits
Science Electives		3 - 6
Junior or higher Biology, Biochemistry, or Engineering Electives		7 - 10

The list of directed elective courses is available in the student handbook and from the student's advisor. Students are encouraged to select elective courses to focus on one concentration area from among the following: biomolecular engineering, biochemical engineering, biopolymer engineering, bioenergy engineering, biomaterials, environmental engineering, industrial engineering or paper engineering.

Internships, Co-ops, and Research Experiences

Bioprocess engineering students enjoy the advantage of hands-on learning in the bioprocess and allied industries through faculty-guided internships and cooperative education (co-op) assignments. All students are required to complete an internship, co-op or research experience in the industry or in a research setting. Internships provide students with valuable experience and financial benefits. There is a two credit course following the Bioprocess Engineering experience to summarize the experience with a report and a presentation for completion of the internship.

Total Minimum Credits For Degree: 128

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Bachelor of Science in Chemical Engineering

[Chemical engineering](#) is a versatile program and one of the most broadly-based engineering disciplines. Its field of practice covers the development, design, and control of processes and products that involve molecular change, both chemical and biological, and the operation of such processes. Because many of the products that sustain and improve life are produced by carefully designed and controlled molecular changes, the chemical engineer serves in a wide variety of industries. These industries range from chemical and energy companies to producers of all types of consumer and specialty products including pharmaceuticals, textiles, pulp and paper, polymers, advanced materials, and solid-state and biomedical devices.

Careers are available in industry, government, consulting, and education. Areas of professional work include research and development, operations, technical service, product development, process and plant design, market analysis and development, process control, and pollution abatement.

The chemical engineering degree program prepares students for professional practice in chemically related careers. Chemical engineering graduates are expected to attain the following capabilities at or within a few years of graduation: apply the fundamentals of science and engineering to solve important chemical engineering problems in industry, government or academic settings; communicate effectively and demonstrate the interpersonal skills required to lead and/or participate in interdisciplinary projects; apply life-long learning to meet professional and personal goals of their chosen profession, including graduate study; articulate and practice professional, ethical, environmental and societal responsibilities, and value different global and cultural perspectives.

The curriculum consists of a number of categories of courses. The general education component, which is required of all ESF students, broadens the students' perspectives on global and societal issues, an important component of any education. Students also take a number of courses in math and the basic sciences—chemistry and physics, (and biology)—to provide the background for the courses that prepare students for engineering practice. The engineering courses cover a variety of topics in chemical engineering. Some selective courses have been placed in the curriculum as elective for students wishing to enter into the pulp and paper industry. The moderate requirement of 127 credits hour allows room for students to supplement more courses at their own desire (no limitation on free electives).

Students may be admitted to the chemical engineering program as first-year students with appropriate science backgrounds from their high school or as transfer students at any level with accommodations for coursework requirements. Students who have the associate degree in engineering science, chemical technology, or general science and mathematics are encouraged to apply as transfer students.

Lower Division Required Courses

APM 205

APM 206

APM 307

APM 485

ECH 132

ECH 133

ECH 202

ECH 212

EFB 103

EFB 104

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223
AND
FCH 224
OR
PSE 223

FOR 207

GNE 160

PHY 211

PHY 221

PHY 212

PHY 222

General Education Electives

Course	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses
APM 395

Professional Experience: ECH 498

2

ECH 304 + ECH 306

ECH 312

ECH 322

ECH 323

ECH 324

ECH 341

ECH 355

ECH 371

ECH 422

ECH 442

ECH 454

ECH 455

ECH 457

ESF 200

EWP 444

*Professional experience: ECH 304 must be taken in the summer and ECH 306 in the Fall semester immediately after, while ECH 498 can be taken in any semester.

Directed Electives

14 credits out of the following directed electives.

Course	Codes*	Credits
Junior or higher engineering directed electives		5 - 14
Science Electives		3 - 9

Total Minimum Credits For Degree: 127

BACHELOR OF SCIENCE IN PAPER ENGINEERING

The paper engineering program is a chemical engineering-based curriculum designed to provide greater depth in fiber and paper processing for students preparing for an engineering career in the pulp, paper and allied industries.

The pulp and paper industry is at the forefront of the renewable resources industry. It represents the first industry that uses biomass in large quantities to produce commodity and specialized products. Graduates are well prepared to move into assignments in the engineering field and advance quickly to positions of responsibility in the analysis and design of processes and equipment. The paper engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Lower Division Required Courses

APM 205

APM 206

APM 307

APM 485

ECH 132

ECH 133

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223

AND

FCH 224

OR

PSE 223

FOR 207

GNE 160

PHY 211

PHY 212

PHY 221

PHY 222

PSE 200

PSE 201

PSE 202

ECH 202

ECH 212

General Education Elective

Course Name	Codes*	Credits
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses

APM 395

ECH 322

ECH 323

ECH 324

ECH 355

ECH 371

ESF 200

EWP 444

PSE 304

PSE 306

PSE 350

PSE 450

PSE 462

PSE 467

PSE 478

PSE 481

EWP 200 and EWP 407 are to be taken in the same semester *in the same time block*. Please consult your advisor if you have question.

Directed Electives

ENGINEERING DIRECTED
ELECTIVES

9 - 12

SCIENCE ELECTIVES

3 - 6

The list of directed elective courses is available in the student handbook and from the student's advisor. Some courses are available in an exchange program with Germany.

Total Minimum Credits For Degree: 128

BACHELOR OF SCIENCE IN RENEWABLE MATERIALS SCIENCE

The renewable materials science program educates students in the science of materials and products made from renewable resources. The program provides an in-depth knowledge of materials such as wood, paper, modern packaging materials, natural fiber materials and advanced materials emphasizing sustainability, environmental consciousness and minimizing environmental footprint.

Students can explore a variety of careers in modern packaging, natural products and renewable materials industries, focused on technical, scientific and managerial tracks. The program will have the following options: paper, wood and polymer science. The third option is conducted with the Department of Chemistry.

Paper Science Option

Lower Division Required Courses

APM 205

APM 206

EFB 336

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 360

FOR 207

GNE 160

GNE 271

PHY 211

PHY 212

PHY 221

PHY 222

PSE 201

PSE 223

RMS 132

RMS 133

RMS 200

ECH 202

ECH 212

General Education Course

Students are required to take one General Education in the following category as well as taking a total of 30 credit hours of General Education coursework in total.

Course Name	Codes*	Credits
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses

APM 391

BPE 310

ESF 200

EWP 444

GNE 273

PSE 456

RMS 335

RMS 387

RMS 388

RMS 422

RMS 465

RMS 468

RMS 481

ESF 200 and EWP 444 are to be taken in the same semester in the same time block. Please consult your advisor if you have questions.

Students are required to take 4 Paper Science directed electives (12 credits).

Directed Electives

Course Name	Codes*	Credits
Science electives		3-6
Junior or higher Paper Science engineering electives		12

Total Minimum Credits For Degree: 124

WOOD SCIENCE OPTION

Lower Division Required Courses

PSE 201

APM 205

APM 206

EFB 336

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 360

GNE 160

GNE 271

FOR 207

PHY 211

PHY 222

PSE 223

RMS 132

RMS 133

RMS 200

General Education Course

Students are required to take one General Education in the following category as well as taking a total of 30 credit hours of General Education coursework in total.

Course Name	Codes*	Credits
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses

ECH 212

APM 391

BPE 310

ESF 200

EWP 444

GNE 273

PSE 456

RMS 322

RMS 335

RMS 387

RMS 388

RMS 422

RMS 465

RMS 468

RMS 481

ESF 200 and EWP 444 are to be taken in the same semester in the same time block. Please consult your advisor if you have questions.

Students are required to take 4 Wood Science electives, selected from the following (12 credits).

Wood Science Electives

CME 326

CME 330

CME 404

CME 410

MCR 480

MCR 580

PSE 438

Total Minimum Credits For Degree: 124

POLYMER SCIENCE OPTION

Lower Division Required Courses

PSE 201

APM 205

APM 206

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223

FCH 224

FOR 207

GNE 160

GNE 271

PHY 211

PHY 212

PHY 221

PHY 222

RMS 132

RMS 133

RMS 200

General Education Course

Students are required to take one General Education in the following category as well as taking a total of 30 credit hours of General Education coursework in total.

Course Name	Codes*	Credits
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses

APM 391

BPE 310

ESF 200

EWP 444

FCH 360

FCH 361

FCH 380

FCH 381

FCH 497

FCH 550

FCH 551

FCH 552

GNE 273

PSE 456

MCR 480

RMS 387

RMS 388

RMS 422

RMS 465

Electives

Course	Codes*	Credits
Polymer Science Electives		9

Total Minimum Credits For Degree: 124

GRADUATE PROGRAM IN CHEMICAL ENGINEERING

The department participates in [graduate education](#) leading to the master of professional studies (M.P.S.), master of science (M.S.) and doctor of philosophy (Ph.D.) degrees in Paper and Bioprocess Engineering. Four options are available within this program:

- [Paper Science and Engineering \(PSE\)](#)
- [Bioprocess Engineering \(BPE\)](#)
- [Biomaterials Engineering \(BME\)](#)
- [Sustainable Engineering Management \(SEM\)](#)

The graduate program allows students to investigate a diverse range of topics in the area of pulp and paper design, process and product development, and manufacturing, as well as the production of chemicals, energy and other products from sustainable raw material sources using both chemical and biological methods. The overall objective of the option is to educate students at the M.P.S., M.S. and Ph.D. level in the development of new processes and products that can be produced in an ecologically sound and sustainable manner.

Options

Paper Science and Engineering Option

The PSE program offers these areas of study:

- Pulp and Bleaching Processes (M.S., Ph.D.)
- Colloidal Chemistry and Fiber Flocculation (M.S., Ph.D.)
- Fiber and Paper Physics (M.S., Ph.D.)
- Process and Environmental Systems Engineering (M.P.S., M.S., Ph.D.)
- Pulp and Paper Technology (M.P.S.)

Bioprocess Engineering Option

Projects conducted in the department under this option develop fundamental knowledge of biorefinery processes for application in the production of a wide spectrum of industrial products and fuels from bioresources, primarily lignocellulosics.

Research is also supported by various U.S. federal and N.Y. state governmental agencies, sometimes in conjunction with private industrial partners.

The BPE program offers areas of study in:

- Biocatalysis and Bioreaction Engineering (M.S., Ph.D.)
- Bioseparations Engineering (M.S., Ph.D.)
- Bioprocess Design, Simulation and Control (M.S., Ph.D.)
- Bioenvironmental Engineering (M.S., Ph.D.)
- Renewable Energy and Biofuels (M.S., Ph.D.)
- Biopharmaceuticals (M.S., Ph.D.)
- Industrial Biological Processes (M.S., Ph.D.)
- Bioprocess Engineering (M.P.S.)

Biomaterials Engineering (BME) Option

The BME option in the Paper and Bioprocess Engineering program offers areas of study in:

- Biocomposite Materials, Biopolymers (M.S., Ph.D.)
- Bioactive Materials and Biosensors (M.S., Ph.D.)
- Nanocomposites and Nanostructured Materials (M.S., Ph.D.)

Sustainable Engineering Management (SEM) Option

The program in Sustainable Engineering Management allows students to investigate a variety of science and engineering topics together with courses in business, management, policy, law and other fields to form a Professional Science Master's program (PSM) recognized by the Council of Graduate Schools.

Students in this program must complete a total of 36 credit hours. The topical core of the program consists of 21 credit hours of courses in their technical field. An additional 12 credits of courses in business, management, policy, law and other areas constitute the "plus" courses in the degree. An integrative experience (3 credit hours) in the form of an internship or research experience is also required. The selection of the "plus" courses as well as technical electives allows students to develop study programs tailored to their individual interests and strengths.

The M.P.S. program in Sustainable Engineering Management is intended for students who:

- have a B.S. degree in an appropriate STEM field and wish to extend their technical knowledge in this area together with obtaining professional skills characterized by the "plus" courses
- have worked in the industry and wish to return for a professional degree that incorporates business skills into the program.

Students entering the M.P.S. program should have a B.S. degree in a science- or engineering-related field. In terms of coursework, students should have the necessary prerequisites to take the courses that are required for the degree or be prepared to take these courses prior to taking the required courses. In general, students should have taken as part of their undergraduate program at least two semesters of calculus, two semesters of general chemistry, a semester of physics and a semester of biology. Additional chemistry, biology, and computer science courses, while not required, would be helpful.

The SEM M.P.S. offers areas of study in:

- Bioprocess Engineering
- Paper Engineering

Wood Science Options

Ph.D. and M.S. Options in Wood Science

Applicants for the M.S. or Ph.D. degrees in the wood science option are required to have a bachelor's degree in science, engineering or related degree. Applicants must have completed at least one semester of coursework in chemistry, biology, physics and calculus.

Areas of study in Wood Science include: Wood drying, wood anatomy and ultrastructure, wood durability and decay, tropical timbers, wood preservation. Applicants must have the appropriate undergraduate degree for the area of study they pursue.

M. P. S. Options in Wood Science

The M.P.S. in Wood Science is open to students with a demonstrated interest in wood science or the wood products industry. A bachelor's degree in science or engineering is strongly recommended. Applicants to the M.P.S. in wood science and technology should have completed at least one semester of coursework in chemistry, biology, physics, and calculus.

Two coursework options are available:

M. P. S. Coursework

Core courses (12-21 credits), construction management courses (3-9 credits), application electives (3-9 credits), professional experience/synthesis (3-6 credits). Courses are selected in consultation with and with approval of the steering committee.

Core courses (12-21 credits):

Construction Management courses: (3 to 9 credits) (or others with committee approval)

Required Courses

CME 587

CME 596

CME 682

CME 686

CME 770

MCR 580

MCR 680

Required Courses

CME 543

CME 653

CME 654

Application Electives: (3-9 credits) (courses selected with committee approval)

Professional Experience/Synthesis (3-6 credits):

Required Courses

CME 898

* **Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) **G** = General Education Course (GenEd), **E** = Engineering, **ES** = Engineering Sciences, **M** = Mathematic, **NS** = Natural Sciences, **PE** = Professional Education, **S** = Summer-only

DEPARTMENT OF CHEMISTRY

Lee Newman, Chair

117 Jahn Laboratory
315-470-4937

ESF's [Department of Chemistry](#) is uniquely organized around the interdisciplinary areas of biochemistry and natural products chemistry, environmental chemistry, and polymer chemistry. The department's 71,000-square-foot Edwin C. Jahn Laboratory is a state-of-the-art facility, fully equipped for modern chemical research and teaching.

Chemistry students gain a strong foundation in the traditional areas of analytical, inorganic, organic, and physical chemistry, but also in the integration of these areas into specialties aligned with the needs of the 21st century. All Chemistry majors participate in research, gaining familiarity with the actual practice of chemistry.

BACHELOR OF SCIENCE IN BIOCHEMISTRY

In pursuing the [Bachelor of Science in Biochemistry](#), students will first build a strong foundation in general chemistry, general biology, physical, and organic chemistry prior to choosing directed and professional electives that will allow them the flexibility to pursue topics that will be relevant to their future career tracks in biochemistry, biotechnology, chemistry or health.

Required Courses

APM 205

APM 206

EFB 101

EFB 102

EFB 103

EFB 104

EWP 190

EWP 290

ESF 200

FCH 132

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223

FCH 224

FCH 232

PHY 211

PHY 212

PHY 221

PHY 222

Elective

Course Name	Codes*	Credits
Math Elective (Calculus III [APM307] or Statistics [APM391])		3
Free Elective		9
General Education Course in two of the following categories: US History & Civic Engagement, The Arts, Social Sciences, World History and Global Awareness, World Languages		6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses EFB 307

EWP 407

FCH 360

FCH 361

FCH 380

FCH 382

FCH 430

OR

FCH 530

FCH 431

OR

FCH 531

FCH 432

OR

FCH 532

FCH 495

FCH 497

Upper Division Electives

Students will take 24 credits of Professional Electives.

1. At least one Professional Elective must have a laboratory component. This course can also count as a Biochemistry-focused Elective if chosen from one of the laboratory courses listed below.
2. At least one Professional Elective must be a biology (EFB or BIO) course and at least one Professional Elective must be a chemistry (FCH or CHE) course. These courses can also count as biochemistry- focused professional electives if chosen from the list below.
3. Of the 24 credits of Professional Electives, at least 12 credits must be chosen from the following short list of biochemistry-focused professional electives.

Coursework suitable for meeting the biochemistry-focused professional electives:

BIO 409

BTC 401

EFB 303

EFB 308

EFB 325

EFB 400

EFB 462

FCH 325

FCH 390

FCH 410

FCH 420

FCH 498

FCH 524

FCH 535

FCH 584

CHE 412

CHE 414

CHE 427

CHE 474

CHE

OR

BCH 477

(list not exhaustive; any science, math, or engineering course at least 300-level counts as PE)

Suggested other Professional Electives (PEs) not considered as a biochemistry-focused electives:

BIO 355

BIO 422

BIO 464

BTC 425

BTC 426

BPE 300

BPE 420

BPE 421

BPE 430

BPE 440

BPE 481

EFB 303

EFB 311

EFB 320

EFB 400

EFB 415

EFB 435

EFB 462

EFB 505

EFB 570

EFB 530

FCH 296

FCH 381

FCH 496

FCH 510

FCH 511

FCH 515

FCH 520

FCH 525

FCH 550

FCH 551

FCH 552

FCH 560

PSE 223

Total Minimum Credits For Degree: 120

BACHELOR OF SCIENCE IN CHEMISTRY

In pursuing a [Bachelor of Science in Chemistry](#), students first receive a strong foundation in analytical, physical, organic and inorganic chemistry before selecting one of three options leading to the degree: biochemistry and natural products, environmental chemistry, and natural and synthetic polymer chemistry.

Each option offers an advanced course of studies beyond the basic courses of the classical undergraduate chemistry curriculum. All options are excellent grounding for professional work at the B.S. level or for advanced graduate study.

Biochemistry and Organic Chemistry of Natural Products

This option stresses a chemical approach to problems in the life and health sciences. Students take advanced courses in natural products chemistry, chemical analysis, and biochemistry. Professional electives in physiology, chemical ecology, genetics and molecular biology strengthen connections in the life and health sciences.

Research areas include the elucidation of chemical signals by which organisms communicate with each other, the role of trace metals in the growth of microorganisms, the origin and function of biologically active natural compounds, and synthetic biology and metabolic engineering for the production of value-added products and antimicrobial compounds.

Environmental Chemistry

Environmental chemistry stresses applications of fundamental chemical principles to describe and predict behavior of chemicals in the environment. After obtaining a strong foundation in analytical, physical and organic chemistry, students pursue advanced study in air and water chemistry:

- FCH 510 Environmental Chemistry I - Aquatic Chemistry
- FCH 511 Environmental Chemistry II - Atmospheric Chemistry
- FCH 515 Methods of Environmental Chemical Analysis

Professional Elective provide students exposure to environmental topics in health, engineering, biology and sustainability. The senior year culminates in a senior research project undertaken under the supervision of one of the chemistry faculty. This give students the opportunity to experience research ranging from laboratory work to field-intensive studies.

Natural and Synthetic Polymer Chemistry

Students take advanced courses in mechanisms of polymerization and polymer synthesis, physical properties and characterization of polymers, and laboratory techniques of polymer synthesis and characterization. Special topics courses in contemporary polymer and material science are available as electives. In addition, courses in carbohydrate chemistry provide a solid background for chemists planning careers in paper, plastic, high-tech, energy, membranes, and related areas. Biochemistry is an appropriate elective for students interested in the growth of biotechnologies while environmental chemistry complements this program for students interested in working on problems of biodegradation.

Lower Division Required Courses

APM 205

APM 206

EFB 102

EFB 103

EFB 104

ESF 200

EWP 190

EWP 290

FCH 132

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223

FCH 224

PHY 211

PHY 212

PHY 221

PHY 222

Lower Division Electives

Course	Codes*	Credits
Math Elective (Calculus III [APM307] OR Statistics [APM391])		

Free Elective		
General Education Course in two of the following categories: US History & Civic Engagement, The Arts, Social Sciences, World History and Global Awareness, World Languages	G	6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses
EWP 407

FCH 325

FCH 360

FCH 361

FCH 380

FCH 381

FCH 382

FCH 410

FCH 495

FCH 497

FCH 498

Note: 5 credits of FCH 498 are required

Upper Division Required Courses

Course	Codes*	Credits
Professional Electives allow students to explore interests in a wide range of areas, including biology, chemistry, ecology, forestry, environmental		

law, mathematics, geology, physics, biophysics, and various engineering disciplines. Professional elective are typically 300-level and above.		
Electives		

Other Courses

Biochemistry and Natural Products Option

FCH 430

OR

FCH 530

FCH 431

OR

FCH 531

FCH 432

OR

FCH 532

Environmental Chemistry Option

FCH 510

FCH 511

FCH 515

Natural and Synthetic Polymer Chemistry Option

FCH 550

FCH 551

FCH 552

Total Minimum Credits for Degree: 121

GRADUATE PROGRAMS CHEMISTRY

The [Department of Chemistry](#) at ESF is unique in that it is structured around four areas of application:

- [Biochemistry](#)
- [Environmental Chemistry](#)

- [Organic Chemistry of Natural Products](#)
- [Polymer Chemistry](#)

Faculty members in the department are internationally recognized experts and are well funded by federal agencies (NSF, DOE, NASA, etc.), industry, government, and NGOs. Graduate students commonly receive national fellowships. The environment for graduate students is challenging but supportive, as faculty are invested in student success.

Graduate degrees require an appropriate program of courses at ESF and Syracuse University. Master of Science and doctoral students must complete a minimum of 18 credit hours and 30 credit hours of graduate level coursework, respectively. In addition, doctoral students must pass a doctoral candidacy examination.

Current research projects encompass natural and synthetic polymer chemistry, biochemistry and microbiology; organic chemistry of natural products and chemical ecology; chemistry of air and water; climate change.

Masters in Professional Studies (M.P.S.) Degree

The [Masters in Professional Studies](#) is a coursework-based program intended for students who need additional courses in Chemistry, but who are not planning on pursuing a research career in the field. M.P.S. students take courses in any of the subject areas of the department: Biochemistry, Environmental Chemistry, Inorganic Chemistry, Natural Products/Organic Chemistry and Polymer Chemistry. The curriculum is sufficiently flexible to allow a student interested in specializing in one of these areas to take the core sequence in that area, although this is not required. Students who have taken any of these courses as undergraduates may not repeat them for graduate credit.

All students entering graduate programs at ESF are expected to be proficient in communication skills, including technical writing and library skills. This requirement can be met by completing at least one course in technical writing and one course in library usage, either as an undergraduate or as a graduate student. Alternatively, graduate students can meet the requirement by demonstrating the equivalent in experience in writing and library skills, as determined by the steering committee.

In addition to the formal coursework, the M.P.S. program also requires an integrative experience that allows the student to synthesize their knowledge. This can be a detailed analysis of one particular area of chemistry, an independent study, internship with industry, or work in a research laboratory. The integrative experience should be approved by the student's steering committee prior to starting. The student will be expected to present a written final report on the integrative experience.

M.P.S. Program Requirements

The Master of Professional Studies (M.P.S.) degree requires a total of 30 credits (minimum) in the following configuration:

Area	Credits
Chemistry	15
Other sciences, engineering and mathematics	6
Seminars	3

Integrative experience (internship or independent study)	3
Elective coursework, seminars, internships or research experience	3
Total (minimum)	30

- **15 credits of graduate chemistry courses**, including chemistry courses are available at ESF and Syracuse University.
- **6 credits of graduate coursework in Science, Mathematics or Engineering.** These may include graduate courses offered at ESF or Syracuse University in physical or biological sciences, mathematics (including statistical analysis), or any area of engineering. Courses must be approved by the student's steering committee.
- **3 credits of seminar:** Either FCH 797 Graduate Seminar may be repeated, or students may choose seminars offered in other departments with approval of the advisor.
- **3 credits for an integrative experience** as FCH 898, Professional Experience/Synthesis in Chemistry.
- **3 credits of additional graduate coursework:** These remaining three credits may be drawn from additional graduate level coursework, seminars, internships and research experience as approved by the student's steering committee.

M.S. & Ph.D. Degrees

The Biochemistry, Environmental Chemistry, and Polymer Chemistry options each have a core sequence of courses that are required for all graduate students in that option. All graduate students must present a public department seminar through FCH 797 plus a capstone seminar.

General Requirements

Steering committee and program of study: By the end of their first year of study, all graduate students must formally identify the two faculty who, in addition to their major professor, will provide guidance for their graduate school career. These two faculty and the major professor constitute the steering committee. These faculty must approve the student's program of study: the list of courses the student will take for their degree. This approval must also occur by the end of the first year. Forms are available online at students' MyESF page.

M.S. Program Requirements

M.S. students are required to take at least 18 credits of coursework or non-thesis research; some options require additional credits. While a certain number of research credits are required, successful completion of an M.S. thesis project is determined by effort and effectiveness, not by credits.

Ph.D. Program Requirements

Ph.D. students are required to take at least 30 credits of coursework or non-dissertation research; some options require additional credits. While a certain number of research credits are required, successful completion of a Ph.D. dissertation project is determined by effort and effectiveness, not by credits.

The candidacy exam at ESF has three formats, but Chemistry usually uses format 2 (research report) or format 3 (the thesis proposal). After authoring the document, students defend it orally in front of their steering committee and one or two examiners.

Areas of Study

There are five graduate areas of study in Chemistry:

Biochemistry (M.P.S., M.S., Ph.D.)

Graduate studies in biochemistry reflect the College's interests in microbial, insect, bio-based fuel, and plant biochemistry.

After completing a one-year sequence in general biochemistry, students select advanced courses from a range of offerings in chemistry, organismal biology and molecular biology. Advanced courses in biochemistry are available both at ESF and Syracuse University.

Environmental Chemistry (M.P.S., M.S., Ph.D.)

The ESF program offering M.S. and Ph.D. degrees in chemistry with an emphasis in environmental chemistry is one of the few doctoral programs of its type within a chemistry department in the United States. The nine core faculty and two participating faculty make it one of the largest such programs in the world.

Students take three core courses in environmental chemistry and one course in biochemistry. Subsequent coursework is carefully selected from regularly offered courses on oceanography, biogeochemistry, analytical methods, sustainability, environmental health and basic areas of chemistry. Coursework is also available in ecology, biology, geology, math and engineering.

Research in environmental chemistry spans a wide range, from fieldwork to laboratory work to computer modeling. Areas of research include global climate change, coral reef ecosystems, biogeochemistry, atmospheric chemistry, regional and global air quality, and transient and persistent organic pollutants. The program avoids a "pollutant of the week" approach that would leave graduates unprepared for future developments. Instead, it emphasizes a framework wherein students can incorporate new knowledge as it becomes available and deal with new problems as they are discovered.

Organic Chemistry of Natural Products (M.P.S., M.S., Ph.D.)

Graduate students in organic chemistry of natural products take a one-year course sequence in mechanistic organic chemistry and another in synthetic organic chemistry. Additionally, one-semester courses are required in physical chemistry and the organic chemistry of natural products.

Courses in biochemistry, inorganic chemistry, statistics and specialized courses in chemistry or biology may be arranged and selected by the student in consultation with faculty.

Research in the field of organic chemistry of natural products takes three paths. These paths are the isolation and characterization of new natural substances; the synthesis of new or improved syntheses of better-known natural substances; and the study of the relation of molecular structure to biological response. Chemical research in each of these areas is coupled with biological testing. Research involving isolation and synthetic chemistry requires the student to develop expertise in separation techniques, such as the several methods of chromatography and spectrometric identification of molecules. Successful investigation in structure/activity relationships requires the student to become familiar with statistical methods of analysis.

Polymer Chemistry (M.P.S., M.S., Ph.D.)

Graduate students in polymer chemistry select their courses from a range of offerings in chemistry, chemical engineering, mathematics, physics, and other appropriate areas. These courses include the one-year sequence in the physical and organic chemistry of polymers and such additional courses as the student and advisor consider necessary.

Special topics in a spectrum of polymer fields are offered or can be arranged in consultation with the faculty.

Chemical Ecology (M.S., M.P.S., Ph.D.)

Chemical ecologists study organismal interactions, both intra- and interspecific, mediated by chemical substances. These interactions occur among microbes, plants, and animals. Study of such interactions typically involves joint efforts of biologists and chemists in basic and applied research in the laboratory and field. The application of chemical ecology has contributed significantly to reduced pesticide use and improved yields in forestry and agriculture while protecting the environment from harmful contaminants.

The study of chemical ecology is offered through collaboration between the Department of Environmental Biology and the Department of Chemistry. Interested students should apply to the department of major interest. Faculty from both areas contribute to the development of a plan of study enabling each student to acquire advanced skills in either biology or chemistry and an ample understanding of the other field to grapple with problems requiring an understanding of both.

DEPARTMENT OF ENVIRONMENTAL BIOLOGY

Stephen Teale, Chair

242 Illick Hall

315-470-6760

315-470-6934 (fax)

The critical importance of natural resources and environmental quality in society demands that aspiring biologists understand natural ecosystems and learn to solve problems effectively. The [Department of Environmental Biology](#) (EB) is committed to ensuring these educational outcomes.

The department offers a dynamic array of opportunities in biology via course work enriched by an active program of research. Through a suite of electives in addition to a required core, undergraduate students may customize their studies in a particular field of interest. Graduate students may pursue master's or doctoral degrees within several areas of study.

Undergraduate Programs

EB offers six undergraduate majors. Environmental Biology is the broadest major and the degree program to which most students apply. The other six are specialized and are recommended for students with more focused educational goals. They are Aquatic and Fisheries Science, Biotechnology, eConservation Biology, Forest Health, and Wildlife Science. For the first year or two the requirements of these programs are similar to those of Environmental Biology and internal transfer among them is straightforward.

Field Study and Training

A hallmark of the EB curriculum is its emphasis on field study and training. All majors offered by the Department of Environmental Biology are hands-on programs that emphasize laboratory and field experience in addition to classroom studies. To this end, every student in each major except Biotechnology is required to complete at least six credit-hours of approved field-based instruction in biology. Three of these six credits are associated with a required core course, EFB 202 (Ecological Monitoring and Biodiversity Assessment), which is offered each summer at the Cranberry Lake Biological Station (CLBS) in the Adirondack Mountains. We recommend students enroll in EFB 202 during the summer between freshman and sophomore years, or as early as possible if you are a transfer student.

The remaining three credit hours of Field Experience are elective and can be satisfied in multiple ways. The following lists identify recent course offerings that satisfy the EB field elective requirement. Be aware that some of these courses may not be offered every year.

Courses offered at CLBS during summer session:

- Field Ethnobotany (EFB337)
- Fungal Diversity and Ecology (EFB342)
- Field Herpetology (EFB384)
- Adirondack Fishes (EFB388)
- Wildlife Techniques (EFB496)
- Ecology of Adirondack Aquatic Ecosystems (EFB496)
- Wetland Plants and Communities of the Adirondacks (EFB496)

- Ecology of Adirondack Insects (EFB496)

Courses offered at the Adirondack Ecological Center and Ranger School:

- Mammalian Winter Ecology (EFB484)
- Forest Technology (FTC204/210/211/236)

Courses offered during Maymester at the Syracuse or regional campuses:

- Forest Health Monitoring (EFB439)
- Field Ornithology (EFB496)
- Flora of Central New York (EFB496)
- Interpreting Field Biology (EFB500)

Other courses offered by ESF faculty:

- Forest Health Senior Synthesis (EFB425)
- Ecosystem Restoration Design (EFB434, 4-cr)
- Periodic field trips courses (EFB500) to locations such as Costa Rica, Ireland, Russia, New Zealand, Australia
- Tropical Ecology (EFB 523)
- Limnology Practicum (EFB525 - 2 cr)
- Ecological Engineering in the Tropics (ERE311)

Field courses, approved by petition, from another accredited university, including but not limited to the following affiliated programs:

- [Sea Education Association SEA](#) (through Boston University)
Note: 'Semester at Sea' is different than 'SEA Semester.' EFB WILL NOT ACCEPT any 'Semester at Sea' courses for upper-division biology or field credits.
- [The School for Field Studies](#) (through University of Minnesota)

An independent research project (EFB 498) or internship (EFB 420) that has received prior departmental approval via petition, and that meets the following departmental criteria.

- At least 50% of student effort (including contact time with instructor and self-directed study) must be conducted in the field (out-of-classroom, out-of-laboratory, out-of-clinic, out-of-captivity).
- Student must demonstrate learning gains in organismal biology, ecological theory, and/or application of field methodologies to study populations, ecological communities or ecosystem processes.
- Students must complete a research or professional product for evaluation.
- 40 hours of effort will garner 1 academic credit-hour.

BACHELOR OF SCIENCE IN AQUATIC AND FISHERIES SCIENCE

Aquatic and fisheries science is the study of aquatic ecosystems to increase scientific understanding and to apply this knowledge to their management and conservation, thereby sustaining them for multiple uses.

Aquatic ecosystems are complex and found within myriad wetlands, streams, lakes, estuaries, and oceans that support life on earth. Professional aquatic scientists and managers work to conserve and restore biodiversity, habitats, and ecological function while supporting services including fisheries, water resources, transportation, energy, recreation and human connections to nature. Career opportunities for students with a B.S. in aquatic and fisheries science include fisheries science, wetland science, limnology, marine biology and oceanography, and numerous conservation-related fields. Typical employment is with federal and state agencies, universities, research institutions, management authorities, and private consulting firms, as well as local, regional, and international non-governmental organizations.

Required Courses

APM 105

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 132

EFB 202

EFB 210

EFB 211

EFB 307

EFB 308

EFB 311

EFB 320

EFB 325

EFB 424

EFB 486

EFB 492

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 210

FOR 207

FOR 110

PHY 102

OR

FCH 223

AND

FCH 224

OR

APM 106

Electives

Course Name	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		27

Open Electives	16
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Directed Electives

To ensure both strength and breadth of knowledge, 27 elective credit hours must be obtained through courses in the following subject areas (S=spring semester, F=fall semester).

A. Field Experience Elective

At least three elective credits must come from an approved field course in biology (this is in addition to the core field course, EFB 202). These credits may be obtained through an elective course at our Cranberry Lake Biological Station, an approved internship (EFB 420) or field trip course (EFB 500). Winter Mammalian Ecology (EFB 484) and Tropical Ecology (EFB 523) meet this requirement, as can approved field courses from other institutions.

B. Structure and Function

At least 3 credit hours must be in the subject area of organism-level physiology, anatomy, or development. The list of allowable courses below may vary slightly from year to year.

- EFB 385—Comparative Vertebrate Anatomy (4 cr.) S
- EFB 427—Plant Anatomy and Development (3 cr.) F
- EFB 462—Animal Physiology: Environmental and Ecological (3 cr.) S
- EFB 429—Plant Physiology (3 cr.) S
- BIO 447—Immunology (3 cr.) S
- BIO 503—Developmental Biology (3 cr.) S

C. Organismal Diversity

To encourage breadth in organism-level biology, students must complete (in addition to the core requirement of EFB 486 or EFB 388) at least 3 credit hours in each of the following two categories:

1. Plants and Microbes:

- EFB 303—Introductory Environmental Microbiology (4 cr.) F
- EFB 326—Plant Evolution, Diversification and Conservation (3 cr.) S
- EFB 327- Adirondack FLora (3 cr.) CLBS
- EFB 336—Dendrology (3 cr.) F
- EFB 340—Forest and Shade Tree Pathology (3 cr.) S
- EFB 350- Microbial Consortium (3 cr.) F even years
- EFB 435—Flowering Plants: Diversity, Evolution, and Systematics (3 cr.) F
- EFB 440—Mycology (3 cr.) F
- EFB 446—Ecology of Mosses (3 cr.) S
- EFB 496 - Wetland Plants & Communities of Adirondacks (3 cr.) **CLBS**
- EFB 496 - Flora of Central NY (3 cr.) **Maymester**

2. Invertebrate and Vertebrate Animals:

- EFB 351—Forest Entomology (3 cr.) F, odd years
- EFB 352—Entomology (3 cr.) F, even years
- EFB 355—Invertebrate Zoology (4 cr.) S
- EFB 388—Ecology of Adirondack Fishes (3 cr.) **CLBS**
- EFB 453—Parasitology (3 cr.) F
- EFB 482—Ornithology (4 cr.) S
- EFB 483—Mammal Diversity (4 cr.) F
- EFB 485—Herpetology (3 cr.) F
- EFB 554—Aquatic Entomology (3 cr.) F
- EFB 566 - Systematic Entomology (3 cr.) S, even years

D. Physical/Chemical Environment

To encourage understanding and familiarity with the aquatic habitat, students must complete at least 3 credit hours from one of the following courses:

- EST 231—Environmental Geology (3 cr.) S
- FCH 510—Environmental Chemistry I (3 cr.) S
- FCH 515—Methods of Environmental Chemical Analysis (3 cr.) F
- FOR 338—Meteorology (3 cr.) S
- FOR 340—Watershed Hydrology (3 cr.) S
- FOR 345—Introduction to Soils (3 cr.) F
- EAR 101—Dynamic Earth (3 cr.) F
- EAR 105—Earth Science (3 cr.) S

E. Environmental Systems Science

To further promote understanding of the systems approach to aquatic ecosystems and an integration of environmental and biological factors, students must complete at least 3 credit hours from one of the following courses.

- EFB 423—Marine Ecology (4 cr.) S, even years
- EFB 516—Ecosystems (3 cr.) S
- EFB 518—Systems Ecology (4 cr.) F
- EFB 523—Tropical Ecology (3 cr.) S
- EFB 542—Freshwater Wetland Ecosystems (3 cr.) S
- ERE 275—Ecological Engineering I (3 cr.) S

F. Management

At least 3 credit hours in resource or ecosystem management must be obtained through a course in the following list.

- EFB 370- Population Biology & Management (3 cr.) S
- EFB 390- Wildlife Ecology & Management (4 cr.) F
- EFB 438- Ecology & Management of Waterfowl (3 cr.) F
- EFB 487—Fisheries Science and Management (3 cr.) F
- FOR 360—Principles of Management (3 cr.) F
- FOR 372—Fundamentals of Outdoor Rec. (3 cr.) F,S
- FOR 442—Watershed Ecology & Management (3 cr.) F

G. Analytical Tools

To increase the breadth of practical skills and knowledge students must complete at least 3 credit hours, obtained through one of the following courses:

- BTC 401—Molecular Biology Techniques (3 cr.) F
- EFB 488—Fisheries Science Practicum (1 cr.) F
- EFB 519—Geographic Modeling (3 cr.) S
- EFB 525—Limnology Practicum (2 cr.) F
- ERE 445—Hydrological Modeling (3 cr.) F
- ESF 300—Introduction to Geospatial Information Technologies (3 cr.) F,S

H. Communications

Students must complete at least 3 credit hours from one of the following communication or interpretation courses.

- EST 370—Introduction to Personal Environmental Interpretation Methods (3 cr.) F
- EST 471- Non-personal Environmental Interpretation Methods (3 cr.) S
- EWP 220—Public Presentation Skills for Environmental Professionals (3 cr.) F,S
- EWP 407—Writing for Environmental and Science Professionals (3 cr.) F

Total Minimum Credits For Degree: 126

BACHELOR OF SCIENCE IN BIOTECHNOLOGY

What is Biotechnology?

Biotechnology is the application of biological organisms, cells, or molecules to produce a product or service for the betterment of humankind. This area of study includes aspects of molecular biology, microbiology, cell biology, biochemistry, and genetic engineering, among other related disciplines.

The Biotechnology Curriculum

The curriculum builds on introductory courses in the sciences including biology, chemistry, calculus, and physics, creating a strong foundation for more advanced upper-level courses. This degree program prepares students to use molecular and biochemical approaches to tackle environmental, natural resource, agricultural, or medical questions, and provides sufficient breadth for students interested in careers veterinary and human medicine. Students who complete this major will be qualified to enter the growing biotechnology job market or continue their studies in graduate or professional school.

The Biotechnology curriculum requires a minimum of 126 total credits. The core requirements are listed in the typical schedule. There are also 12 credits of directed electives that can be chosen from a list of approved courses. Twenty open elective credits can be selected depending on a student's individual interests. There are also many courses offered at Syracuse University or the SUNY Upstate Medical University that could be used to fill these electives and open electives.

Required Courses

APM 105

APM 106

APM 391

BTC 132

BTC 401

BTC 420

OR

BTC 498

BTC 497

BTC 499

EFB 101

EFB 102

EFB 103

EFB 104

EFB 303

EFB 307

EFB 308

EFB 311

EFB 320

EFB 325

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223

FCH 224

FCH 430

FCH 432

PHY 101

PHY 100

NOTE: BTC 420 (Internship in Biotechnology) is typically done in the summer.

NOTE: 5 credits of BTC 498 or BTC 420 are required.

Electives

Course Name	Code*	Credit
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General Education Course in two of the following categories: US History & Civic Engagement, The Arts, Social Sciences, World History and Global Awareness, World Languages	G	6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		12
Open Electives		23

Directed Electives - Biotechnology

A minimum of 12 credits of directed elective courses required. Courses numbered 420, 495, and 498 cannot count as directed electives.

Although any combination of courses below may satisfy the minimum 12 credits required, the following list has been categorized into 4 of the most common subject areas of interest to BTC students, as well as those courses that would be suitable for multiple subject areas of interest. These groupings of elective courses are guidelines. Probably no two students in the biotechnology program have exactly the same career goals or interests. Consult your advisor if your subject interests vary.

Courses that fit multiple areas of interest

- FCH 380 Analytical Chemistry I (2 cr.) F
- FCH 381 Analytical Chemistry II (3 cr.) S
- FCH 510 Environmental Chemistry (3 cr.) S
- FCH 431 Biotechnology lab (3 cr.) F
- FCH 531 Biochemistry lab (3 cr.) F
- FCH 584 Spectro ID/Organic Compounds (3 cr.)
- MCR 480 Fundamentals of Microscopy (3 cr.) F
- MCR 484 Scanning Electron Microscopy (3 cr.) F
- MCR 485 Transmission Electron Microscopy (3 cr.) S
- BIO 422 Bioinformatics for Life Scientists (3 cr.) – SU course
- BIO 440 Applied Genomics (3 cr.) – SU course
- BIO 442 Seminar in Model Organism Genetics (3 cr.) – SU course
- BIO 443 Seminar in Epigenetics (3 cr.) – SU course
- BIO 450 Seminar in Evolutionary Genetics (3 cr.) – SU course
- BIO 463 Molecular Genetics (4 cr.) – SU course
- BIO 463 Molecular Biotechnology (4 cr.) – SU course
- BIO 464 Applied Biotechnology (4 cr.) – SU course
- BCM 477 Proteins and Nucleic Acids Lab (3 cr.) – SU course
- BCM 484 Biomolecular Modeling (3 cr.) – SU course
- BEN 541 Principles of Tissue Engineering (3 cr.) – SU course

Pre-health (Pre-Veterinary, Pre-Medical, etc.)

- EFB 360 Epidemiology (3 cr.) F
- EFB 385 Comparative Vertebrate Anatomy (4 cr.) S
- EFB 400 Toxic Health Hazards (3 cr.) F
- EFB 453 Parasitology (3 cr.) F
- EFB 462 Animal Physiology: Environmental & Ecological (4 cr.) F
- EFB 463 Ecotoxicology (3 cr.) S
- EHS 320 Disease Prevention (3 cr.) S
- FCH 390 Drugs from the Wild (3 cr.) F
- BIO 211 Introduction to Neuroscience (3 cr.) S – SU course
- BIO 216 Anatomy and Physiology I (4 cr.) F – SU course
- BIO 217 Anatomy and Physiology II (4 cr.) S – SU course
- BIO 316 Anatomy & Physiology I for Biology Majors (4 cr.) – SU course
- BIO 317 Anatomy & Physiology II for Biology Majors (4 cr.) – SU course
- BIO 355 General Physiology (3 cr.) S – SU course
- BIO 396 Stem Cells and Society (3 cr.) – SU course
- BIO 441 Seminar in Infectious Diseases (3 cr.) S – SU course
- BIO 446 Epigenetics of Human Health and Diseases (3 cr.) – SU course
- BIO 447 Basic Immunology (3 cr.) – SU course
- BIO 448 Evolutionary Medicine (3 cr.) – SU course
- BIO 468 Microbiomes Biotech & Medicine (3 cr.) – SU course
- BIO 473 Pharmaceuticals & Cells (3 cr.) – SU course
- BIO 501 Biology of Cancer (3 cr.) – SU course
- BIO 503 Developmental Biology (3 cr.) – SU course

Plant Biotechnology

- BTC 425 Plant Biotechnology (3 cr.) S
- BTC 426 Intro. Plant Tissue Culture (3 cr.) F
- EFB 427 Plant Anatomy and Development (3 cr.) F
- EFB 530 Plant Physiology (3 cr.) S
- EFB 531 Plant Physiology Lab (2 cr.) S
- FCH 630 Plant Biochemistry (3 cr.) S

Microbial Biotechnology

- EFB 340 Forest & Shade tree Pathology (3 cr.) S
- EFB 440 Mycology (3 cr.) F
- EFB 505 Microbial Ecology (2 cr.) S

Bioprocess Engineering

- PSE 200 Introduction to Papermaking (3 cr.)*
- PSE 202 Pulp and Paper Laboratory Skills (1 cr.)*
- PSE 223 Introduction to Lignocellulosics (4 cr.)*
- PSE 361 Engineering Thermodynamics (3 cr.)*
- PSE 370/570 Principles of Mass and Energy Balance (3 cr.)**
- PSE 371 Fluid Mechanics (3 cr.)*
- BPE 300 Introduction to Industrial Bioprocessing (3 cr.)*
- PSE 350/550 Fiber Processing (3 cr.)**
- PSE 450/650 Pulping and Bleaching Processes (3 cr.)**
- PSE 465/665 Fiber and Paper Properties (3 cr.)*
- PSE 438/638 Biorenewable Fibrous and Nonfibrous products (3 cr.)**
- BPE 310 Colloid and Interface Science (3 cr.)*

- BPE 420/620 Bioseparations (3 cr.)**
- BPE 438/638 Introduction to Biorefinery Processes (3 cr.)**
- BPE 510 Introduction to Polymer Coatings (3 cr.)
- BPE 536 Radiation Curing of Polymer Technologies (3 cr.)
- BPE 658 Advanced Biocatalysis (3 cr.)
- BEN 364/664 Quantitative Physiology (4 cr.) – SU course**
- BEN 421/621 Biochemical Engineering (3 cr.) – SU course**
- BEN 433/633 Drug Delivery (3 cr.) – SU course**
- BEN 462/662 Biofuels, Bioproducts, and Biorefining (3 cr.) – SU course**
- BEN 468/668 Biomaterials & Medical Devices (3 cr.) – SU course**
- BEN 473/673 Biomanufacturing (3 cr.) – SU course**
- BEN 481 Bioinstrumentation (3 cr.) – SU course
- BEN 561 Polymer Science & Engineering (3 cr.) – SU course

*Useful background and prerequisite courses if you are planning on entering the MPS program in Paper and Bioprocess Engineering.

**The graduate level course may be applicable to the MPS program in Paper and Bioprocess Engineering.

Total Minimum Credits For Degree: 126

BACHELOR OF SCIENCE IN CONSERVATION BIOLOGY

Conservation biology is the application of science to conserve the earth's imperiled species and ecosystems.

The field is growing rapidly and ever increasing in importance in response to the biodiversity crisis, perhaps the most critical environmental issue of our time. Conservation biologists view all of nature's diversity as important and having inherent value. This diversity spans the biological hierarchy and includes variation at the level of genes, populations, communities, ecosystems, and biomes.

Required Courses

APM 105

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 132

EFB 202

EFB 210

EFB 211

EFB 307

EFB 308

EFB 311

EFB 320

EFB 370

EFB 414

EFB 420

OR

EFB 498

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FOR 110

Electives

Course Name	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		30
Open Electives		22

Directed Electives

To ensure that Conservation Biology undergraduates obtain both strength and breadth of knowledge, 30 elective credit hours must be distributed in a way that satisfies seven requirements (A-F, below).

A. Field Experience Elective

At least three elective credits from an approved field course in biology (in addition to the core field course, EFB 202). These credits are typically obtained through an elective course at our [Cranberry Lake Biological Station](#), an approved internship (EFB 420) or field trip course (EFB 500). Approved field courses from other institutions can also fulfill this requirement. No single class may be used to fulfill directed elective requirements of A and B.

B. Biodiversity Specialization (at least three courses from the following list)

The availability of courses that satisfy this requirement varies. The suggestions below are pre-approved courses that are typically taken - consult with your advisor or the curriculum coordinator about other possibilities. Many other courses can potentially substitute (by petition) for those listed. No single class may be used to fulfill directed elective requirements of A and B.

- EFB 303 Introductory Environmental Microbiology (4 cr.) F
- EFB 326 Plant Evolution, Diversification and Conservation (3 cr.) S
- EFB 327 Adirondack Flora (3 cr.) CLBS
- EFB 336 Dendrology (3 cr.) F
- EFB 340 Forest and Shade Tree Pathology (3 cr.) S
- EFB 342 Fungal Diversity and Ecology (3 cr.) **CLBS**
- EFB 350 Microbial Consortia (3 cr.) S
- EFB 351 Forest Entomology (3 cr.) **F, even years**
- EFB 352 Entomology (3 cr.) **F, odd years**
- EFB 355 Invertebrate Zoology (4 cr.) S
- EFB 388 Ecology of Adirondack Fisheries (3 cr.) **CLBS**
- EFB 435 Flowering Plants: Diversity, Evolution, and Systematics (3 cr.) F
- EFB 440 Mycology (3 cr.) F
- EFB 446 Ecology of Mosses (3 cr.) S
- EFB 453 Parasitology (3 cr.) F
- EFB 479 Field Ornithology (3 cr.) **CLBS**
- EFB 482 Ornithology (4 cr.) S
- EFB 483 Mammal Diversity (4 cr.) F
- EFB 485 Herpetology (3 cr.) F
- EFB 486 Ichthyology (3 cr.) S
- EFB 496 Wetland Plants & Communities of Adirondacks (3 cr.) **CLBS**
- EFB 496 Flora of Central NY (3 cr.) **Maymester**
- EFB 554 Aquatic Entomology (3 cr.) F
- EFB 566 Systematic Entomology (3 cr.) S, even years

C. Applied Conservation Biology (at least 6 credits)

- EFB 305 Indigenous Issues in the Environment (3 cr.) S
- EFB 390 Wildlife Ecology and Management (4 cr.) F
- EFB 423 Marine Ecology (4 cr.) S, even years
- EFB 424 Limnology (3 cr.) F
- EFB 438 Ecology and Management of Waterfowl (3 cr.) F
- EFB 444 Biodiversity and Geography of Nature (3 cr.) F
- EFB 449 Wetlands Habitat Management for Wildlife (3 cr.) S
- EFB 463 Ecotoxicology (3 cr.) S
- EFB 480 Animal Behavior (3 cr.) F
- EFB 487 Fisheries Science & Management (3 cr.) F
- EFB 493 Management of Wildlife Habitats & Populations (3 cr.) F
- EFB 502 Ecology and Management of Invasive Species (3 cr.) S
- EFB 504 Plant- Herbivore Interactions (3 cr.) F, odd years
- EFB 542 Freshwater Wetland Ecosystems (3 cr.) S
- FOR 332 Forest Ecology (3 cr.) F
- FOR 442 Watershed Ecology and Management (3 cr.) F

D. Human Dimensions (at least 3 credits)

- EST 312 Sociology of Natural Resources (3 cr.) S
- EST 353 Behavior Change and the Environment (3 cr.) F
- EST 366 Attitudes, Values, & Env. (3 cr.) S
- EST 390 Social Processes and Environment (3 cr.) S
- EST 460 Land Use Law (3 cr.) S
- EST 472 Nat Hist Museums and Modern Sci (3 cr.) **Maymester**
- EWP 390 Intro to Literature of Nature (3 cr.) F
- FOR 360 Principles of Management (3 cr.) F
- FOR 465 Natural Resources and Environ. Policy (3 cr.) F
- FOR 487 Environmental Law and Policy (3cr.) F
- FOR 489 Natural Resources Law and Policy (3cr.) S

E. Communications and Interpretation (at least 3 credits)

- EST 370 Introduction to Personal Environmental Interpretation Methods (3 cr.) F
- EST 471 Non-Personal Environmental Interpretation Methods (3 cr.) S
- EST 472 Advanced Interpretation and Environmental Education (3 cr.) S
- EWP 220 Public Presentation Skills (3 cr.) F,S
- EWP 407 Writing for Environmental and Science Professionals (3 cr.) F,S

F. Technical Skills (at least 3 credits)

- BTC 401 Molecular Biol. Techniques (3 cr.) F
- BTC 425 Plant Biotechnology (3 cr.) S
- BTC 426 Plant Tissue Culture Methods (3 cr.) F
- EFB 518 System Ecology (4 cr.) F
- ERE 365 Principles of Remote Sensing (4 cr.) S
- ERE 445 Hydrological Modeling (3 cr.) F
- ESF 300 Introduction to Geospatial Information Technologies (3 cr.) F,S
- MCR 484 Scanning Electron Microscopy (3 cr.) F
- MCR 485 Transmission Electron Microscopy (3 cr.) S
- MCR 585 Light Microscopy for Research Applications (3 cr.) S

Total Minimum Credits For Degree: 126

BACHELOR OF SCIENCE IN ENVIRONMENTAL BIOLOGY

The curriculum for the [bachelor of science degree in environmental biology](#) is built around a core of required courses that provides a general education, a background in the principles of biological and physical science, and an orientation to natural resources and other environmental concerns.

From this common foundation, the large number of elective credits allows each student to develop a unique plan of study, with the help of an assigned advisor who is expert in the student's general area of interest. In keeping with the hands-on, field orientation of our curriculum, students also must complete six credit hours of field experience.

Required Courses

APM 105

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 132

EFB 202

EFB 210

EFB 211

EFB 307

EFB 308

EFB 311

EFB 320

EFB 325

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 210

FOR 110

PHY 102

OR

FCH 223

AND

FCH 224

OR

APM 106

Electives

Course	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		25
Open Electives		28

Directed Electives: UPPER DIVISION BIOLOGY-Environmental Biology

To ensure that ENB undergraduates obtain both strength and breadth of knowledge, **25 elective credit** hours in biology must be obtained through courses designed for juniors or seniors (i.e., courses numbered 300 or higher). Among them must be courses that satisfy requirements A-C (below).

A. Field Experience Elective

At least 3 elective credits must come from an approved field biology course (in addition to the core field course, EFB 202). These credits may be obtained through an elective course

at [Cranberry Lake Biological Station](#); an approved field course from another accredited institution; an approved internship (EFB 420) or independent research project (EFB498); or a field trip course (EFB 500). Some courses at CLBS meet both requirement A and a diversity requirement.

B. Structure and Function

At least 3 credit hours must be in the subject area of organism-level physiology, anatomy, or development. The list of allowable courses below may vary slightly from year to year.

- EFB 385 Comparative Vertebrate Anatomy (4 cr.) S
- EFB 427 Plant Anatomy and Development (3 cr.) F
- EFB 429 Plant Physiology (3 cr.) S
- EFB 462 Animal Physiology: Environmental and Ecological (4 cr.) F
- BIO 316 Anatomy & Physiology for Biology Majors (4 cr.) F,S (Not BIO 216)
- BIO 355 General Physiology (3 cr.) F
- BIO 447 Immunology (3 cr.) F
- BIO 503 Developmental Biology (3 cr.) S

C. Organismal Diversity

To encourage breadth in organism-level biology, students must complete at least one course from two of the four groups. (A course from each of the groups is strongly recommended).

1. Diversity of Microorganisms

- EFB 303 Introductory Environmental Microbiology (4 cr.) F
- EFB 340 Forest and Shade Tree Pathology (3 cr.) S
- EFB 342 Fungal Diversity and Ecology (3cr.) CLBS
- EFB 350 Microbial Consortia (3 cr.) S
- EFB 440 Mycology (3 cr.) F

2. Diversity of Plants

- EFB 326 Plant Evolution, Diversification and Conservation (3 cr.) S
- EFB 327 Adirondack Flora (3 cr.) CLBS
- EFB 336 Dendrology (3 cr.) F
- EFB 435 Flowering Plants: Diversity, Evolution, and Systematics (3 cr.) F
- EFB 446 Ecology of Mosses (3 cr.) S
- EFB 496 Flora of Central NY (3 cr.) **Maymester**
- EFB 496 Wetland Plants & Communities of Adirondacks (3 cr.) **CLBS**

3. Diversity of Invertebrate Animals

- EFB 351 Forest Entomology (3 cr.) F, odd years
- EFB 352 Entomology (3 cr.) F, even years
- EFB 355 Invertebrate Zoology (4 cr.) S
- EFB 453 Parasitology (3 cr.) F
- EFB 554 Aquatic Entomology (3 cr.) F
- EFB 566 Systematic Entomology (3 cr.) S, even years

4. Diversity of Vertebrate Animals

- EFB 388 Ecology of Adirondack Fishes (3 cr.) CLBS
- EFB 479 Field Ornithology (3 cr.) CLBS
- EFB 482 Ornithology (4 cr.) S
- EFB 483 Mammal Diversity (4 cr.) F
- EFB 485 Herpetology (3 cr.) S
- EFB 486 Ichthyology (3 cr.) F

Note that some courses at CLBS meet both requirement A and a diversity requirement.

Total Minimum Credits For Degree: 126

BACHELOR OF SCIENCE IN FOREST HEALTH

Forest Health is a multidisciplinary and collaborative field of study that involves the understanding, monitoring, and protection of the world's forest resources. Forests support biodiversity, provide immense ecosystem services including water purification and carbon sequestration, and provide essential raw materials. Forest health experts support healthy forests by managing threats caused by invasive species, poor management, climate change, fire, and other anthropogenic factors.

A foundation in forest health requires coursework in ecology, dendrology, forest management, silviculture, mycology, plant pathology, and entomology. This major was developed to address the demand for broadly trained graduates to work in wide range of professional capacities in government agencies, the private sector, and academia.

Required Courses

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 132

EFB 202

EFB 210

EFB 211

EFB 245

OR

EFB 344

EFB 303

EFB 307

EFB 308

EFB 311

EFB 320

EFB 336

EFB 340

EFB 351

OR

EFB 352

EFB 420

OR

EFB 498

EFB 425

EFB 439

EFB 494

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FCH 210

FOR 344

FOR 345

FOR 110

NOTE: 3 credits of EFB 498 or EFB 420 are required.

Electives

Course	Codes*	Credits
General Education Course in one of the following categories: US History	G	3

& Civic Engagement, The Arts, World History and Global Awareness, World Languages		
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		15
Open Electives		19

Directed Electives

To ensure that Forest Health majors obtain both strength and breadth of knowledge, 15 elective credit hours must be selected from the following list, including at least one course from five of the seven categories.

A. Forest Protection and Conservation Biology

- EFB 390 Wildlife Ecology & Management (4 cr.) F
- EFB 413 Intro Conservation Biology (3 cr.) S
- EFB 502 Ecology and Management of Invasive Species (3 cr.) F

B. Forestry/Wood Products

- FOR 322 Natural Resources Measurements and Sampling (3 cr.) F
- FOR 360 Principles of Management (3 cr.) F,S
- FOR 465 Natural Resources and Policy (3 cr.) S
- FOR 480 Urban Forestry (3 cr.)
- RMS 376 Decay of Wood Products (3 cr.) S

C. Technology

- BTC 401 Molecular Biology Techniques (3 cr.) F
- BTC 425 Plant Biotechnology (3 cr.) S
- BTC 426 Plant Tissue Culture Methods (3 cr.) F
- ESF 300 Introduction to Geospatial Information Technologies (3 cr.) F,S

D. Ecology and Environmental Science

- EST 370 Introduction to Personal Environmental Interpretation Methods (3 cr.) F
- EFB 445 Plant Ecology and Global Change (3 cr.) S
- EFB 505 Microbial Ecology (3 cr.) S
- EFB 516 Ecosystems (3 cr.) S
- EFB 518 Systems Ecology (3 cr.) F
- FOR 338 Meteorology (3 cr.) F

E. Biodiversity

- EFB 326 Plant Evolution, Diversification and Conservation (3 cr.) S
- EFB 342 Fungal Ecology and Diversity (3 cr.) CLBS
- EFB 351 Forest Entomology (3 cr.) F, even years
- EFB 352 Entomology (3 cr.) F, odd years
- EFB 355 Invertebrate Zoology (4 cr.) S
- EFB 428 Mycorrhizal Ecology (3 cr.) F even years
- EFB 435 Flowering Plants: Diversity, Evolution, and Systematics (3 cr.) F
- EFB 440 Mycology (A) (3 cr.) F
- EFB 453 Parasitology (3 cr.) F
- EFB 482 Ornithology (4 cr.) S
- EFB 493 Mammal Diversity (4 cr.) F
- EFB 485 Herpetology (3 cr.) F
- EFB 486 Ichthyology (3 cr.) S
- EFB 566 Systematic Entomology (3 cr.) S, even years

F. Mathematics and Physical Science

- APM 105 Survey of Calculus and Application I (4 cr.) F,S
- APM 106 Calculus and its Applications II (A) (4 cr.) F,S
- APM 510 Statistical Analysis (3 cr.) F
- FOR 323 Forest Biometrics (3 cr.) S
- PHY 102 General Physics II (A) (4 cr.) S

G. Anatomy and Physiology

- EFB 325 Cell Biology (3 cr.) S
- EFB 427 Plant Anatomy and Development (3 cr.) F
- EFB 462 Animal Physiology: Environmental & Ecological (4 cr.) F
- EFB 530 Plant Physiology (3 cr.) S
- EFB 531 Plant Physiology Lab (2 cr.) S
- EFB 570 Insect Physiology (3 cr.) S

Total Minimum Credits For Degree: 126

BACHELOR OF SCIENCE IN WILDLIFE SCIENCE

Wildlife science is the application of ecological knowledge in a manner that strikes a balance between the needs of wildlife populations and the needs of people. Coursework and faculty expertise span the animal kingdom and the planet, with a programmatic emphasis on North American species, policies, and practices. The focus is applied ecology, and students gain the skills, knowledge, and abilities required to meet contemporary and future challenges facing wildlife such as restoring habitat, securing populations of rare and vulnerable species, mitigating human-wildlife conflicts, controlling invasive species and disease, managing sustainable harvests, and ensuring species persistence under climate change. The curriculum prepares students for working in state or federal wildlife agencies, non-governmental conservation organizations, or consulting firms and also prepares students for continuing on to a graduate degree program, which may greatly expand employment opportunities and is often necessary for careertrack positions.

Required Courses

APM 105

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 132

EFB 202

EFB 210

EFB 211

EFB 307

EFB 308

EFB 311

EFB 320

EFB 390

EFB 491

EFB 493

ESF 300

EWP 190

EWP 220

FCH 150

FCH 151

FCH 152

FCH 153

FOR 110

OR

FCH 210

OR

FOR 345

FOR 465

OR

FOR 489

EFB 482

OR

EFB 483

Electives

Course	Codes*	Credits
General Education Course in two of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		18
Open Electives		22

Directed Electives

To ensure that Wildlife Science undergraduates obtain both strength and breadth of knowledge, and position themselves for professional certification by The Wildlife Society, 18 elective credits must be obtained in the following subject areas (A-D), through specific courses that are designed for juniors or seniors (i.e. courses numbered 300 or higher)

A. Field experience (3 credits):

This requirement can be satisfied during any year, and is normally done via coursework at [Cranberry Lake Biological Station](#). ESF field courses offered during semester break, field courses offered by other institutions or organizations (e.g. School for Field Studies), independent research projects, or job-related internships during the summer session.

B. Vertebrate Structure and Function (3 credits):

Choose at least one course from the following:

- EFB 385 Comparative Vertebrate Anatomy (4 cr.) S
- EFB 462 Animal Physiology: Environmental and Ecological (4 cr.) F
- EFB 480 Principles of Animal Behavior (4 cr.) F

C. Botany and Plant Science (6 credits)

Choose at least two courses from the following:

- EFB 326 Plant Evolution, Diversification and Conservation (3 cr.) S
- EFB 336 Dendrology (3 cr.) F
- EFB 337 Field Ethnobotany (3 cr) **CLBS**
- EFB 340 Forest Shade and Tree Pathology (3 cr.) F
- EFB 427 Plant Anatomy and Development (3 cr.) F
- EFB 429 Plant Physiology (3 cr.) S
- EFB 435 Flowering Plants: Diversity, Evolution and Systematics (3 cr.) F
- EFB 440 Mycology (3 cr.) F
- EFB 445 Plant Ecology and Global Change (3 cr.) S
- EFB 446 Ecology of Mosses (3 cr.) S
- EFB 496 Wetland Plants & Communities of Adirondacks (3 cr.) **CLBS**
- EFB 496 Flora of Central NY (3 cr.) **Maymester**

D. Wildlife Specialization (6 credits):

choose at least two courses from one or more categories as listed below:

1. Population and habitat management:
 - EFB 370 Population Ecology and Management (3 cr.) S
 - EFB 438 Ecology and Management of Waterfowl (3 cr.)
 - EFB 449 Wetlands Conservation and Management (3 cr.) S, even years
 - EFB 487 Fisheries Science and Management (3 cr.) F
 - EFB 502 Ecology and Management of Invasive Species (3 cr.) S
 - EFB 518 Systems Ecology: Ecological Modelling and Design
 - FOR 232 Natural Resources Ecology (3 cr.) S
 - FOR 442 Watershed Ecology and Management (3 cr.) F
 - FOR 496 Forest Management and Wildlife (3 cr.) S
2. Wildlife Health:
 - EFB 360 Epidemiology (3 cr.) F
 - EFB 400 Toxic Health Hazards (3 cr.) F
 - EFB 453 Parasitology (3 cr.) F
 - EFB 462 Animal Physiology: Environmental and Ecological (4 cr.) S
3. Biodiversity
 - EFB 352 Entomology (3 cr.) F
 - EFB 355 Invertebrate Zoology (4 cr.) S
 - EFB 413 Introduction to Conservation Biology (3 cr.) F
 - EFB 486 Ichthyology (3 cr.) S
 - EFB 485 Herpetology (3 cr.) F
4. Human dimensions of conservation
 - EFB 305 Indigenous Issues and the Environment (3 cr.) S
 - EST 353 Behavior Change and the Environment (3 cr.) F
 - EST 390 Social Processes and the Environment (3 cr.) S
 - EST 366 Attitudes, Values and the Environment (3 cr.) S, even years
 - EST 460 Land Use Law (3 cr.) S
 - EST 312 Sociology of Natural Resources (3 cr.) S
 - EST 493 Environmental Communication Workshop (3 cr.) S

Total Minimum Credits For Degree: 126

GRADUATE PROGRAMS IN THE DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY

[Environmental Biology](#) department offers MS, MPS and PhD in Environmental and Forest Biology with areas of research designed to provide a strong background and focus to students pursuing different research topics. Faculty with nationally and internationally recognized expertise define the scope of subject matter within each study area, recommend acceptance of students, and guide them through a course of study appropriate to student goals and aspirations. Most students develop a degree of depth and specialization in at least one areas of graduate study (see below).

M.S.

The master of science degree in Environmental and Forest Biology entails a research-based thesis (6-12 credits of thesis research) in addition to 18-24 credits of graduate coursework (including special research topics and at least three seminars) for a total of at least 30 graduate credits. Students earning a M.S. degree find a much wider range of job options that have greater responsibilities and compensation compared to jobs that require only a B.S. degree. Many jobs at the M.S. level require an ability to perform research. Students interested in research positions in government, non-profit organizations, and academic and industry settings should pursue a M.S., rather than M.P.S. degree. Additionally, although not required by many graduate schools, a M.S. degree is often a key step toward earning a Ph.D. The M.S. student presents a thesis proposal to the major professor and committee who will guide completion of the research and writing of the thesis. A capstone seminar and defense of thesis are required.

M.P.S.

The master of professional studies degree in Environmental and Forest Biology requires graduate coursework credits graduate seminars and professional experience (internship). The M.P.S. degree is designed to accommodate a great breadth of student goals and needs, including students desiring additional education following some experience in their field, and science teachers seeking the master's degree for permanent certification. As in all degree programs in EFB, the student will be guided through the M.P.S. by a steering committee.

Ph.D.

The doctor of philosophy degree in Environmental and Forest Biology may be pursued directly from the bachelor's level, or following a master's degree program. Doctoral study culminates in a dissertation (or its equivalent as refereed publications) based on original research. In many cases this work serves as a foundation for future studies and publications throughout the student's career. Research activity is often funded through extramural grants to the student's major professor. Abundant opportunities exist to gain teaching experience during the doctoral program. A written and oral examination is required to proceed to doctoral candidacy, at least one year prior to the capstone seminar and defense of the dissertation. Of the 60 credits required, 30-48 are awarded for coursework (including special research topics and at least five seminars) and 12-30 credits for the dissertation.

Graduate Research Areas

Applied Aquatic & Fisheries Science

Study in this area provides advanced preparation in biological concepts of fisheries and aquatic sciences as they relate to ecology and resource management. M.P.S. students will undertake a professional experience in management or policy, or a synthesis course in aquatic ecology and management planning. M.S. and Ph.D. students will address important research questions with advanced methods in aquatic sciences. Research themes are diverse, examples include parasitology, zebrafish colony management, fish physiology, behavior, otolith microchemistry, population ecology and habitat relationships, restoration, hypoxia and environmental change, trophic dynamics and food webs, species conservation, species at risk, biodiversity, fisheries management, stream ecology, larval fishes, early life history, wetlands, invasive species ecology, limnology, marine ecology, contaminants, environmental change.

Chemical Ecology

Chemical ecologists study organismal interactions, both intra- and interspecific, mediated by chemical substances. These interactions occur among microbes, plants, and animals. Study of such interactions typically involves joint efforts of biologists and chemists in basic and applied research in the laboratory and field. The application of chemical ecology has contributed significantly to reduced pesticide use and improved yields in forestry and agriculture while protecting the environment from harmful contaminants.

The study of chemical ecology is offered through collaboration between the Department of Environmental Biology and the Department of Chemistry. Interested students should apply to the department of major interest. Faculty from both areas contribute to the development of a plan of study enabling each student to acquire advanced skills in either biology or chemistry and an ample understanding of the other field to grapple with problems requiring an understanding of both.

Conservation Biology

This area entails study and maintenance of biological diversity at the level of genes, populations, communities, ecosystems and biomes; intellectual underpinnings include evolutionary theory, systematic biology, population biology and ecosystem science. Conservation biology seeks ways to integrate biological principles with social, economic and political perspectives to achieve conservation goals.

Ecology and Evolution

This integrative study area allows students to investigate the relationships of organisms to their environment and those factors that affect their distribution and abundance. Both the practical and theoretical applications of ecology are emphasized through courses and research.

There are four major areas in ecology: organismal ecology, population-evolutionary ecology, community ecology and systems ecology. In consultation with the student's steering committee, courses are chosen from these areas, as well as other disciplines. Specific research may encompass any of the four major areas of ecology and entail the study of the distribution and abundance of organisms, community structure including trophic relationships, diversity, succession and ecosystem properties, such as patterns of energy transfer and biogeochemical cycling.

Entomology

Graduate study opportunities prepare students in the basic aspects of insect life and the role of insects in relation to humans and their environment.

The wide range of effects stemming from insect activity, from the beneficial to the deleterious, allows for a variety of research subjects in which insects play a major role. Thesis topics may concern insects that affect forests, shade trees and wood products, those relating to the health and well-being of humans, those playing key roles as parasites and predators of pest species, and those serving as food for many birds and vertebrate animals. Current research areas include population dynamics of forest defoliators, pheromone communications in beetles and moths, evolution of chemical communication, effects of forest practices on stream benthic insects, natural control of insects in forest systems and biochemistry of insect detoxification mechanisms.

Environmental Biotechnology

Environmental Biotechnology is defined as a branch of biotechnology that addresses environmental problems, such as the genetic rescue of a species, the removal of pollution, renewable energy generation or biomass production, all by using biological processes for the protection and restoration of the quality of the environment.

The tools of biotechnology are having ever increasing applications to conserving our natural environments. Examples include the restoration of species and ecosystems, phyto- and microbial-remediation of polluted soils and water, making cleaner, more efficient and recyclable products, and increasing our understanding of how the environment works at molecular and cellular levels. The study of environmental biotechnology provides opportunity in a broad range of specialties fundamental to the understanding of plants, animals, and microbes and their interaction with other organisms and environments.

Indigenous People & the Environment

Indigenous people are the stewards of fully 4% of the land area of the United States and represent some 700 distinct communities possessing detailed knowledge of the biota of their homelands. Native American land holdings in North America collectively contain more wildlands than all of the National Parks and Nature Conservancy areas in North America. Globally, Indigenous people inhabit areas with some of the highest remaining biodiversity on the planet and are actively being engaged as partners in biodiversity conservation. Issues of sustainable development, resource management and ecological restoration all include Native American stakeholders. Federal agencies are required to consult with tribes on a government-to-government basis on a host of scientific and natural resource policies. Thus, our ESF graduates have a high probability of encountering issues involving Indigenous cultures and TEK.

However, the majority of scientific professionals and educators have little understanding of the value of TEK or its cultural context. Exposure to TEK has a legitimate role in the education of the next generation of biologists, environmental scientists, and natural resource managers. TEK has value not only for the wealth of biological information it contains, but for the cultural framework of respect, reciprocity and responsibility in which it is embedded (Kimmerer 1998, Pierotti and Wildcat 2000). The Center for Native People and the Environment has developed a series of integrated educational offerings that will enrich our curriculum with coursework and allied programs that increase student's awareness of TEK and Native American perspectives on the environment.

Microbiology

Graduate study opportunities exploring the role and diversity of microbes in clinical, industrial, and environmental realms.

Our understanding of microbes' central role in host health & physiology, biogeochemical processes, and global change continues to expand. ESF's Microbiology program provides a basic education in the core disciplines of microbiology, but relies heavily on student-driven cutting-edge research. Depending on the major professor, training will include basic microbiological, molecular, and computational techniques to answer current questions in microbiology. Current research areas include, but are not limited to, pathogenic microbiology, microbial ecology, virology, bacteriology, microbial diversity and physiology, host-microbe interactions, and vector-borne diseases. Graduate degrees in microbiology better prepare students for a wide range of clinical, industrial, or environmental microbiology occupations.

Molecular Biology and Ecology

Graduate students in this integrative program develop and apply molecular biological methods to address questions in Ecology.

Students in this graduate area conduct interdisciplinary research using molecular tools to address important ecological and evolutionary questions. Students work with their faculty advisor to develop research projects, often combining both laboratory and field work. Areas of research at ESF cut across several disciplines, and include phylogenetics, biogeography, phylogeography, population genetics, genomics, conservation genetics, animal and plant diseases, immunology, and biodiversity. Coursework requirements developed with the major professor and steering committee, and are tailored to individual student project and career goals.

Mycology and Forest Pathology

The study of Mycology and Forest Pathology provides opportunity in a broad range of specialties fundamental to the understanding of fungi and their interaction with other organisms, and for specializations in forest pathology.

Graduate students in this program are provided with advanced preparation in the biology of fungi and in the concepts and practicalities of forest pathology. Current research interests include; taxonomy and systematics of fungi; mycorrhizal ecology; biology of parasites and symbionts; growth, developmental biology, and ultrastructure of fungi; disease resistance in trees; genetic engineering; plant-pathogen interactions; fungal phylogenetics; molecular ecology; biodiversity and conservation of fungi.

Students in this graduate area use a range of tools to address important questions pertaining to the above. Students work with their faculty advisor to develop research projects, often combining both laboratory and field work. Coursework requirements are developed with the major professor and steering committee and are tailored to individual student project and career goals.

Plant Science

Plants, as the base for ecological food chains, serve as the structural and functional foundation of natural and managed systems. The study of plant science and biotechnology provides opportunity in a broad range of specialties fundamental to the understanding of plants and their interaction with other organisms and for specializing in plant biotechnology.

Emphasis is on forests and related plant systems. Current research interests include dynamics of plant communities as affected by humans and the environment; mechanisms of plant succession; epidemiology of forest and urban tree diseases; taxonomy, physiology, growth and ultrastructure of fungi; heritability of wood properties and disease resistance of trees; biochemistry and physiology of plant stress response; photosynthesis; mycorrhizae; plant reproductive biology; genetic engineering; transformation; molecular evolution; phylogenetics; taxonomy; plant-pathogen interactions, tissue culture and study of ancient DNA.

Wildlife Ecology and Management Ecology

Study in this area provides students with advanced preparation in biological concepts of wildlife populations as they relate to resource management. M.P.S. students will undertake a professional experience in wildlife management or policy, or a synthesis course in wildlife management planning. M.S. and Ph.D. students will address important research questions in wildlife science, typically aimed at supporting resource management agencies in their decision making.

The work of a wildlife biologist is diverse and often includes monitoring the status of wildlife populations, restoration of declining or extirpated species or populations, managing sustainable harvests of game species, identifying and managing threats to wildlife and their habitat, mitigation of human-wildlife conflict, and communicating wildlife issues and regulations with the public. Graduate education is rapidly becoming a universal prerequisite to employment as a professional wildlife biologist. A major strength of our program is the diversity of our research partners, including the U.S. Fish and Wildlife Service, National Park Service, U.S. Department of Agriculture, U.S. Environmental Protection Agency, U.S. Geological Survey, the New York State Department of Environmental Conservation, and many other state agencies. Graduate students working on agency-funded projects typically network with representatives from these agencies, which often opens up career opportunities. Certification by The Wildlife Society is supported by our faculty, and also enhances career opportunities because many state and federal agencies, and consulting firms give hiring preference to those who are certified. Graduates with an advanced degree in Wildlife Ecology and Management from ESF are employed worldwide, with nearly 100 percent placement shortly after graduation.

** **Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) **G** = General Education Course (GenEd), **E** = Engineering, **ES** = Engineering Sciences, **M** = Mathematic, **NS** = Natural Sciences, **PE** = Professional Education, **S** = Summer-only*

DEPARTMENT OF ENVIRONMENTAL RESOURCES ENGINEERING

Stephen Shaw, Chair

402 Baker Laboratory

315-470-6633

315-470-6958 (fax)

Our departmental mission is to engage in teaching, research, and service to advance environmental resources engineering practices and meet the needs of the world. Faculty strengths are in ecological engineering, geospatial engineering, water resources engineering, and the broader field of environmental resources engineering. Teaching includes innovative class, lab, and field exercises in foundational and advanced engineering topics, where our flexible curriculum allows students to focus on traditional or novel engineering practices. Students receive a well-balanced education, including courses that consider the social, economic, and environmental impacts of engineering practice, fundamental engineering and environmental engineering courses, and specialized courses that capture the breadth of their field of study.

The ERE department is internationally recognized for coupling research and service, and many ERE courses address community needs. The [ERE department](#) provides unparalleled mentoring to train students in engineering science and design so they can join our alumni as leaders in professional practice and research.

BACHELOR OF SCIENCE IN ENVIRONMENTAL RESOURCES ENGINEERING

[Environmental Resources Engineering](#) degree program prepares graduates to operate with professional competence in environmental resources engineering. A broad base of study in engineering fundamentals enables graduates to enter professional practices that focus on the use and protection of soil, water, air, and other renewable and non-renewable resources. The program aims to educate professionals who will ensure sustainable development through environmentally responsible engineering solutions. **This program is accredited as an environmental engineering program by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.**

Lower Division Required Courses

APM 205

APM 206

APM 307

APM 485

EFB 101

EFB 102

ERE 132

ERE 133

ERE 275

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

GNE 271

GNE 273

PHY 211	3
PHY 212	3
PHY 221	1
PHY 222	1

"C-" is a requirement for students to pass each calculus course and move into the next course. This requirement is necessary to ensure engineering students have the quantitative skills to succeed in the ERE program. The admissions office uses C as a threshold for the calculus courses when students want to transfer into the ERE program.

Lower Division Electives

Course	Codes*	Credits
General Education Course in two of the following categories: US History & Civic Engagement, The Arts, Social Science, World History and Global Awareness, World Languages	G	6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Earth Science Elective: FOR 345, FCH 399, FOR 338, EAR105, EAR 111, or EAR 117	G	3
Biology Elective: EFB 103, EFB 303, EFB 307, EFB 320, EFB 360, EFB 400, EFB 424, EST 220, FOR 232, FOR 332, FOR 334, or FOR 442	G	3

Upper Division Required Courses APM 395

CEE 337	3
ERE 335	
ERE 339	
ERE 340	

ERE 365

ERE 371

ERE 430

ERE 440

ERE 468

ERE 480

ERE 488

ERE 489

Upper Division Electives

Course	Codes*	Credits
<p>Engineering Fundamentals Elective</p> <p>These courses are intended to introduce or reinforce basic concepts and theory within the engineering sciences. They are intended as intermediate level classes that build on lower division electives.</p> <p>Pre-approved SUNY ESF Engineering Fundamentals Elective courses are:</p> <ul style="list-style-type: none">• PSE 361 Engineering Thermodynamics• PSE 370 Principles of Mass and Energy Balances• CME 404 Applied Structures• Any approved Engineering Elective <p>Pre-approved Syracuse University courses that satisfy the engineering fundamentals elective include:</p> <ul style="list-style-type: none">• ELE 231 Electrical Engineering Fundamentals• MAE 251 Thermodynamics		3

<ul style="list-style-type: none"> • ECS 222 Dynamics 		
<p>Engineering Elective These courses focus on theory and application of scientific principles and quantitative skills to monitor, assess, or design in the environmental resources engineering profession.</p> <p>Pre-approved SUNY ESF Engineering Elective courses are:</p> <ul style="list-style-type: none"> • ERE 311 Ecological Engineering in the Tropics • ERE 412 River Form and Process • ERE 445 Hydrologic Modeling • ERE 465 Environmental Systems Engineering • GNE 461 Air Pollution Engineering • ERE 496 and ERE 596 Special Topics courses must be approved by the Department prior to registration <p>Pre-approved Syracuse University courses that may be used to satisfy engineering electives include:</p> <ul style="list-style-type: none"> • CEE 331 Analysis of Structures and Materials • CEE 332 Design of Concrete Structures • CEE 338 Foundation Engineering • CEE 443 Transportation Engineering • CEE 473 Transport Processes in Environmental Engineering • Special Topics courses offered through Syracuse University's L.C. Smith College of Engineering must be pre-approved by 	E	9

<p>the Department prior to registration</p> <p>500-599 Graduate courses designed expressly for areas of specialization in post-baccalaureate programs. Qualified undergraduate students may enroll with permission of the instructor.</p> <p>600-699 Graduate courses are designed expressly for advanced levels of specialization. Undergraduate students with a cumulative grade point average of 3.000 or better may enroll in these courses with an approved petition.</p> <ul style="list-style-type: none"> • ERE 621 Spatial Analysis • ERE 622 Digital Image Analysis (requires permission of instructor) • ERE 674 Methods in Ecological Treatment • ERE 693 GIS-Based Modeling (requires permission of instructor) 		
<p>Technical Elective These courses focus on techniques, theory, and skills to advance competence in professional practice.</p> <p>Any CEE class, any APM class 200 level and above; any BPE class 300 level and above; any BTC class; any CME class with the exception of CME 202; any EFB class with the exception of EFB 120, 200, 217, 220, and 312; any EHS class; any ERE class; ESF 300 any FCH class 200 level and above; any FOR class 320 and above with exception of 475 to 478; any GNE class; or any SRE class. Any Special Topics course (496 or 596) must be</p>		6

approved by the Department prior to registration.		
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Total Minimum Credits For Degree: 128

* **Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) **G** = General Education Course (GenEd), **E** = Engineering, **ES** = Engineering Sciences, **M** = Mathematic, **NS** = Natural Sciences, **PE** = Professional Education, **S** = Summer-only

GRADUATE PROGRAM IN ENVIRONMENTAL RESOURCES ENGINEERING

ERE participates in graduate education leading to the master of engineering, the master of professional studies, master of science, and doctor of philosophy degrees in environmental resources engineering. Graduate studies and research are primarily concerned with environmental and resource-related problems. ERE graduate students apply science and engineering to the conservation, restoration, holistic development, and improved utilization of the natural environment and its related resources.

Applicants to all programs of study are required to have a bachelor's degree in science or engineering and are expected to have completed at least one 3-credit course in physics, one 3-credit course in statistics, and two 3-credit courses in calculus. Students admitted without necessary background are required to take additional prerequisite courses required by the department.

Degrees

The Master of Engineering (M.E.) degree requires the successful completion of a minimum of 33 credits at the graduate level, of which 27 are in coursework. A 6 credit capstone design experience completes the M.E. degree requirements.

The Master of Professional Studies (M.P.S.) degree requires the successful completion of a minimum of 30 credits at the graduate level, of which at least 24 must be in coursework. A 3-6 credit comprehensive project or practicum completes the M.P.S. degree requirements.

The Master of Science (M.S.) degree requires the successful completion of a minimum of 30 credits at the graduate level, of which 18-24 are for coursework and 6-12 credits are for the thesis.

The Doctor of Philosophy (Ph.D.) degree requires the successful completion of a minimum of 60 credits at the graduate level, of which 30-48 are for coursework and 12-30 credits are for the dissertation.

All graduate degrees in ERE require completion of at least 15 credit hours of graduate coursework in engineering and applied science courses. A seminar is also required. Program mastery courses may be satisfied by prior study. Plans of study are individualized by academic advisors so that students acquire needed depth and breadth in their training and courses and reach their professional goals.

Graduate Options

There are five graduate options for the M.P.S., M.S., and Ph.D. degrees:

Ecological Engineering (M.P.S., M.S., Ph.D.)

Ecological Engineering is the design of ecosystems for the mutual benefit of humans and the environment. Ideal design considers humans to be part of nature rather than apart from nature.

At ESF we believe that ecological engineering education and research should meet local to global needs. We teach and research sustainable solutions and approach ecological engineering broadly, working in many areas of the world and in most major areas of ecological engineering.

Program Requirements

Program prerequisite or co-requisite courses beyond the departmental requirement include at least one semester of study in thermodynamics, fluid mechanics, or statics; probability and statistics; ecology; and hydrology.

Program mastery courses include at least one course (3+ credit hours) in each of these areas of competence: 1) Ecosystem Restoration; 2) Pollutant Treatment; 3) Modeling; and 4) Ecosystem Sciences.

Environmental Management (M.P.S.)

Environmental Management combines environmental engineering science with environmental policy, social sciences, and management tools to provide breadth and perspective for the student aspiring to managerial responsibility.

Student coursework is designed to enhance technical and problem-solving skills to meet contemporary needs of environmental managers.

Program Requirements

Program prerequisite or co-requisite courses beyond the departmental requirement include at least one semester of study in at least three of the following fields: chemistry; computer science; environmental science; economics; and geographic measurements.

Program mastery courses include at least one course (3+ credit hours) in each of these areas of competence: 1) Project Management; 2) Environmental Policy; 3) Environmental Resources Engineering.

Environmental Resources Engineering (M.P.S., M.S., Ph.D.)

Environmental Resources Engineering takes an interdisciplinary approach to solve environmental resource-related problems in urban and natural settings.

Emphasis is placed on applying science and engineering principles to the analysis and design of engineered systems, processes and products that improve the conservation, restoration, development, and utilization of the built and natural environments. Students use modern engineering tools and techniques such as micrometeorology, remote sensing, hydrodynamic and atmospheric modeling, and systems analysis.

Program Requirements

Program prerequisite or co-requisite courses beyond the departmental requirements include at least one semester of study in thermodynamics, fluid mechanics, or statics; hydrology, chemistry, or biology; and computing methods.

Program mastery courses are arranged to meet the objectives of the individual student program. A student's program of study in this option may combine competence areas in the other ERE options, or introduce new competence areas.

Geospatial Information Science and Engineering (M.P.S., M.S., Ph.D.)

Geospatial Information Science and Engineering is designed for specialized study in spatial information acquisition, analysis, modeling and applications.

This includes theoretical and applied projects in sensing systems and the location, measurement, analysis and description of ground features and earth resources. It also includes use of geographic information systems (GIS) to incorporate spatial data into a wide range of environmental and engineering problems.

Program Requirements

Program prerequisite or co-requisite courses beyond the departmental requirement include at least one year of physics and one engineering science course in surveying, numerical methods, or computer science.

Program mastery courses include at least one course (3+ credit hours) in each of these areas of competence: 1) remote sensing; 2) geographic information systems; 3) spatial analysis and programming; 4) statistics.

Students in the MPS program will take additional coursework in at least one of these areas, MS students will take additional coursework in at least two areas, and Ph.D. students will take additional coursework in at least three of these areas.

In addition to competence areas listed above, there is flexibility for students interested in supplementary areas. For example, students in the past have expanded their knowledge in geography, ecology, forestry, systems analysis, electrical/computer engineering and mathematics. Courses from these competence areas are identified in consultation with the Major Professor and Steering Committee.

Water Resources Engineering (M.P.S., M.S., Ph.D.)

Water Resources Engineering addresses the analysis, prediction and design of water resource systems.

Emphasis is placed on applying engineering techniques to reduce impacts on human and natural systems. Students pursue solutions to water resources problems, in recognition of environmental, economic, legal, social and managerial constraints. The department has computing facilities, field sites, and a fluids laboratory with a tilting sediment recirculating flume and river geomorphology table to support research activities. The program takes advantage of departmental expertise in GIS and remote sensing to address problems at a variety of scales. Analytic techniques typically blend a combination of statistics, numerical analyses, and computer science.

Program Requirements

Program prerequisite or co-requisite courses beyond the departmental requirement include at least one semester of study in fluid mechanics, computing methods, and engineering hydrology.

Program mastery courses include at least one course (3+ credit hours) in each of these areas of competence: 1) physical hydrology; 2) computational modeling; and 3) water quality.

DIVISION OF ENVIRONMENTAL SCIENCE

Russell D. Briggs, Division Director

358 Illick Hall
315-470-6989

[Environmental science](#) at ESF is an interdisciplinary degree program that takes full advantage of its location within an environmentally focused college. The program offers students a tremendous variety of courses and faculty members to choose from, excellent facilities for research and field study, and a level of faculty expertise that is rarely found at other colleges.

The faculty members who deliver the program perform teaching, research and public service activities to promote environmental practices that will improve the lives of people within New York state and around the world.

The program's objectives are to prepare students who:

- Will engage in environmental work while employed by government agencies and industry or in private consulting jobs that specialize in public works and the inventory, management, design, use, restoration, and protection of natural and cultural resources,
- Are prepared to enter advanced academic studies involved with any of the many aspects of environmental science, and
- Will continue to develop the knowledge and skills needed to adapt to changing technological, environmental, and business conditions to the benefit of society, employer and self.

BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE

The curriculum in the bachelor's degree program provides a strong foundation in the sciences and introduces students to the interdisciplinary breadth of [environmental science](#) through a selection of core courses dealing with the geographical, physical, social and living environments.

- **Senior Staff Assistant/Curriculum Coordinator:** [Ann Moore](#)

Students have the flexibility to satisfy their core requirements by completing courses in biology, chemistry, ecology, geography, engineering, forestry, environmental studies and other areas of study. College-wide general education requirements provide additional opportunities for students to complete courses in the arts, humanities and social sciences to develop a broader context for personal and professional growth.

Required Courses

APM 105

APM 106

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 320

ENS 132

ESF 300

EWP 190

EWP 290

EWP 407

FCH 150

FCH 151

FCH 152

FCH 153	
FOR 207	
PHY 211	3
PHY 212	3
PHY 221	1
PHY 222	1

Lower Division Electives

Course	Codes*	Credits
Free electives		12
General Education Course in two of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Environmental Science Core

Students must complete one course from each of the following environmental science core areas.

NOTE: Courses used to complete the advanced chemistry, biology, or mathematics requirements, environmental science core requirements, or option requirements may NOT be used to satisfy more than one of these requirements.

The Physical Environment

EAR 305	3
EAR 403	3
ERE 380	
EST 231	
FCH 210	
FCH 221	

AND
FCH 222

FCH 360

FOR 338

FOR 340

FOR 345

GNE 172

The Living Environment
EFB 303

EFB 326

EFB 327

EFB 336

EFB 342

EFB 345

EFB 351

EFB 355

EFB 351

EFB 355

EFB 384

EFB 388

EFB 440

EFB 462

EFB 483

EFB 485

EFB 486

The Social Environment
EST 220

EFB 337

EST 361

EST 390

EST 450

EWP 390

FOR 465

FOR 487

FOR 489

Advanced Courses in Chemistry, Biology or Mathematics

An advanced course is one that has at least one prerequisite or is numbered 300 or above.
Note: Courses used to complete the advanced courses in chemistry, biology or mathematics requirement may NOT be used to complete the environmental science core or option requirements.

Required Courses

Course	Codes*	Credits
Advanced Courses in science or mathematics		6

Option Area

Students must complete at least 15 credits in ONE of the following option areas of study. Courses used to complete the advanced chemistry, biology, or mathematics requirements; environmental science core requirements; or upper division electives may not be used to satisfy the option area requirements.

Environmental Information and Mapping (16 credits required)

ERE 365

ERE 371

FOR 458

GEO 381

LSA 300

OR

3

EFB 518

Water Science (15 credits required)

FOR 340

FOR 345

FOR 442

Choose TWO courses from the list below:

Watershed Science

EFB 423

EFB 424

EFB 486

EFB 487

EFB 542

ERE 412

ERE 508

FOR 338

GEO 316 3

CEE 657 3

NOTE: CIE 657, Ecological Biogeochemistry, is an upper-division Syracuse University course. Access by petition only; confer with your academic advisor.

Health and the Environment (17 credits required)

Required Courses

EHS 250

EFB 400

EFB 360

Elective courses

EFB 303

EFB 307

EFB 308

EFB 325

EFB 385

EFB 453

EFB 462

EHS 320

EHS 350

EHS 440

EHS 480

ENS 470

FST 102

3

Earth and Atmospheric Systems Science & Analysis

(16 credits required)

Required Courses

FCH 399

EFB 424

FOR 345

Choose TWO courses from the list below:

Elective course

APM 307

APM 485

APM 585

CIE 457

3

ERE 365

FCH 380

FCH 381

FCH 510

FCH 511

FCH 515

MCR 480

NOTE: Upon consultation with option area coordinator, students may select courses beyond those listed above that align with professional goals.

Renewable Energy

(15 credits required)

Required Courses

SRE 441

OR

CME 305

SRE 325

SRE 337

SRE 479

and a minimum of 3 credits from the following:

Elective Course

CME 305

ERE 380

EST 427

FCH 360

ECH 202

ECH 212

SRE 422

SRE 416

SRE 454

PHY 305

Upper Division Electives

Course	Codes*	Credits
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Electives		15
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Students completing the environmental science program must complete 15 credits of upper division electives to satisfy the graduation requirements. Course taken to satisfy the advanced math/science or option areas cannot also be used to satisfy the upper division elective requirement.

Under the guidance of their academic advisor, students may design their own block of electives. Course selection should support the student's capstone research, career or advanced academic study goals. Alternatively, this requirement can also be satisfied by choosing an official college minor. A list of minors is available:

Undergraduate Minors

Senior Synthesis

Capstone Courses

ENS 498 1

ENS 498 3

OR

ENS 420

Project-Oriented Coursework* 3

ENS 494

ENS 498

OR

ENS 420

NOTE: ENS 498 and ENS 420 are taken for 3 credits

*Students may select from a list of project-oriented coursework to fulfill their senior synthesis requirement. Upon consultation with their advisor, students may also select courses beyond those listed on a case-by-case basis. Acceptable courses include:

- ENS 496 Renewable Energy Capstone Seminar
- ENS 596 International Interdisciplinary Urban Ecosystem Design
- EFB 525 Limnology Practicum (student will need to enroll in an additional credit hour)
- ESF 496 Special Topics classes (must confer with advisor)
- Other

Total Minimum Credits For Degree: 126

BACHELOR OF SCIENCE IN ENVIRONMENTAL HEALTH

Environmental health focuses on the study of how people interact with their environment—the air and water around us, the plants and animals we encounter, and the workplaces and homes where we spend much of our lives. The field is broad, encompassing the direct effects of the environment on human health, and the factors that adversely affect the ecological balances essential to human health and environmental quality.

Core Courses

APM 105

APM 106

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 303

EFB 360

EFB 400

EHS 250

EHS 320

EHS 350

EHS 360

EHS 420

EHS 440

EHS 480

ENS 132

ENS 470

ENS 494

ESF 200

EWP 190

FCH 150

FCH 151

FCH 152

FCH 153

FCH 221

FCH 222

FCH 223

FCH 224

FCH 399

NSD 114 2

PHY 101 4

PHY 102 4

NOTE: PHY 101 and PHY 102 both include a lab.

General Education Electives

Course	Codes*	Credits
General Education Course in two of the following categories: US History & Civic Engagement, The Arts, Social Sciences, World History and Global Awareness, World Languages	G	6
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Focus Area Electives

21 credits required for breadth and depth of knowledge.

Breadth: 3 credits from each of 3 focus areas (total of nine credits)

Depth: 12 credits from a fourth focus area.

NOTE: Some Focus Area Elective courses may have prerequisites, effectively exceeding the 126 minimum credit requirement for the B.S.

NOTE: Only three credits total from the 21 can be from a 200-level course or lower without prior approval of the curriculum coordinator.

A. Built Environment

Courses

EST 132

EST 220

EST 231

LSA 311

LSA 326

LSA 451

LSA 470

B. Geospatial Technology

Courses

ERE 365

ERE 371

ERE 553

ERE 566

ESF 300

C. Soils

Courses

ERE 511

FOR 332

FOR 345

FOR 535

FOR 635

D. Water and Wastewater

Students interested in this focus area are encouraged to take APM205 and APM206 in place of APM105 and APM106, as the higher level calculus is required for many of the courses; also students interested in this focus area are encouraged to take PHY211/221 and PHY212/222 in place of PHY101 and PHY102, as the higher level physics is required for many of the courses.

Courses

CEE 442		4
EAR 401		3
EAR 420	Contaminant Hydrogeology	3
EFB 496		
EFB 505	Microbial Ecology	2
ERE 275		
ERE 339		
ERE 340		
ERE 440		
ERE 480		
FCH 360		
FCH 510		
FOR 487		

E. Solid/Hazardous Materials and Waste Management

Courses

CEE 341		3
EFB 496		
ERE 275		
ERE 340		

ERE 405

ERE 465

ERE 468

ERE 480

FOR 487

F. Hydrogeology

Courses

EAR 401		3
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EAR 420	Contaminant Hydrogeology	3
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ERE 480

ENS 496	Hydrology	3
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Human Health

ERE 508

FOR 340

FOR 345

FOR 442

G. Food Protection

Courses

FST 102		3
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FST 307		3
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FST 402		3
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FST 421	Morality of a Meal: Food Ethic	3
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NSD 114		3
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NSD 115		3
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NSD 225		3
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NSD 427		3
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NSD 455	3
NSD 481	3
NSD 555	3

H. Public Health

Courses

PHP 221		3
PHP 309		3
FST 403		3
PHP 302		3
PHP 305		3
PHP 313		3
PHP 306		3
PHP 318		3
PHP 414		3
PHP 415		3
PHP 437	LGBTQ Health	3
	Well Being	
PHP 438	Native American Health Promotion	3
PHP 462		3
PHP 463		3

I. Pre Medical Track

Students taking this track as their depth area must also select courses from 4 other focus areas, rather than three other focus areas for their breadth. This focus area does not count as one of the three breadth areas, but courses can count as Open Electives.

Courses

BTC 498
EFB 307

EFB 308

EFB 325

EFB 385

FCH 530

FCH 532

Open Electives

Six (6) Credit hours. Students can take more than the 4 hours of open electives, but need to be aware that those extra credits will not substitute for required courses. Students are encouraged but not required to use some of their open electives to do research projects either on or off campus within the EHS framework. Below are listed some courses that might be of interest to EHS students.

EST 203 Introduction to Sociology

EST 220 Urban Ecology

EST 245 Foundations of Environmental Communication

EST 321 Government and the Environment

EST 361 History of the American Environmental Movement

EST 390 Social Processes and the Environment

EST 395 Public Communication of Science and Technology

EST 426 Community Planning and Sustainability

EFB 217 Peoples, Plagues, and Pests

EFB 352 Entomology

EFB 453 Parasitology

LSA 190 Clashing Perspectives in the Built Environment

FOR 202 Introduction to Sociology

FOR 204 Natural Resources in American History

FOR 489 Natural Resources Law and Policy

Total Minimum Credits For Degree: 126

NOTE: For students considering a career in Environmental Risk Assessment or Environmental Remediation, it is strongly recommended that they take:

ENV 165 Hazardous Waste Operations and Emergency Response (2 Credits) at Onondaga Community College over Winter Break. This course culminates with the awarding of the 40 hour HAZWOPER Certification, which is required by OSHA and many potential internship sponsors or employers.

GRADUATE PROGRAM IN ENVIRONMENTAL SCIENCE (GPES)

Russell Briggs, Graduate Program Coordinator
202 Baker Lab
315-470-6989

The [Graduate Program in Environmental Science \(GPES\)](#) supports interdisciplinary environmental research and teaching at SUNY ESF and offers unique graduate programs that serve the needs of our students. GPES is comprised of faculty from each of the seven departments at SUNY ESF who understand the importance of interdisciplinary collaborations to manage and solve critical environmental problems.

Requirements

The academic requirements of the graduate program in environmental science are designed to provide graduates with a sound preparation to meet the rapidly evolving challenges of the field as leading scholars and professionals. Programmatic requirements constitute a framework which includes a comprehensive core foundation emphasizing theory, issues and methods; extended knowledge within an area of study; and a synthesis experience.

In addition, students should have an academic background and/or work experience related to the selected area of study. Wherever possible, deficiencies should be made up prior to matriculation.

Master of Science (M.S.)

The Master's Degree is designed as a two-year experience. The minimum total credits for the degree is 30. Lists of courses that meet requirements identified in this section have been approved by each area of study.

These lists are not exclusive; courses not on these lists may be taken with the approval of the Major Professor and Steering Committee, as indicated on the Form 3B.

Required credit hours are identified in three categories:

- a. **Core:** The broad interdepartmental focus of GPES is reflected in the core requirements - A minimum of 9 credit hours distributed in 3 areas: social science, natural or physical science, and methods/tools.
- b. **Area of Study:** A minimum of 15 credit hours (excluding 898 and 899 courses) in AOS courses are required.
- c. **Thesis:** A minimum of 6 credit hours of research resulting in a document that clearly demonstrates graduate level accomplishments of the student, followed by a defense examination. Students must have an approved Thesis Proposal.

Concurrent Degree

Concurrent degree students may "double count" 8 credit hours toward their M.S. degree.

Environmental Science Seminar

There is no seminar requirement for the Master of Science.

Advanced Standing

A maximum of 6 graduate credit hours with a grade of B or above that have not been applied to another degree may be transferred via petition. The petition must include an attached syllabus and a justification of how the courses are to be included on the student's Plan Sheet.

Petitions regarding Core requirements may be submitted following matriculation. Petitions regarding Area of Study requirements are to be submitted following the formalization of the student's steering committee (submission of Form 2A establishes the steering committee).

Master of Professional Studies (M.P.S.)

The Master of Professional Studies (MPS) degree is a 30 credit hour experience aimed at professional applications of environmental knowledge.

Core Requirements

Required course work: A total of 9 credit hours that includes one 3-hour social science course, one 3-hour natural or physical science course, and one 3-hour methods or tools course emphasizing applications of technical knowledge.

Area of Study Requirements

A minimum of 12-15 credit hours of course works in the chosen area of study, as determined by the major professor and study area faculty. Students in the Water and Wetland Resources program are required to take either (i) a minimum of 18** credit hours of area of study coursework and 3 hours of synthesis OR (ii) 15 credit hours of coursework in the area of study combined with 6 hours of synthesis. Students select a study area at the time of application for admission into the program.

A minimum of 12 credit hours of coursework is required in the chosen area of study, as determined by the major professor and study area faculty. Students select a study area at the time of application for admission to the program.

Synthesis Requirements

Students select either an Internship (minimum of 3 credit hours) or prepare a synthesis paper (3 credit hours). Some internships may extend to 6 credit hours, reducing electives to 0. All students must present a capstone seminar in their final semester and submit a written Capstone report documenting their research or internship experience. The length, depth, and format of the report is at the discretion of the student's supervisory committee. See Appendix B for internship guidance.

Advanced Standing

- a. Course transfers. A maximum of six graduate credit hours with a grade of B or above that have not been applied to another degree may be transferred via Petition. The Petition must

- include an attached syllabus, and a justification of how the courses are to be included on the student's Plan Sheet. Petitions for course transfers are submitted following matriculation.
- b. Credit for prior experience. Applicants with a minimum of three (3) years of post-baccalaureate full-time professional experience directly related to the intended area of study may apply for 6 credit hours of advanced standing in the program. Partial credit for experience cannot be awarded. When awarded for prior work experience, the 6 credit hours are applied toward the Synthesis requirement.

c. [All College Forms](#)

Concurrent Degree

Concurrent degree students may "double-count" 8 credit hours toward their MPS degree.

Environmental Science Seminar

All students are required to take two (2) semesters of ENS 797 Environmental Science Seminar OR, in consultation with the Major Professor, appropriate seminars in other ESF departments or Syracuse University (the latter for credit only). ENS 797 is normally completed as an Audit, but at times may be taken for credit if offered.

Doctor of Philosophy (Ph.D.)

The Ph.D. program provides a unique opportunity to develop integrative research within a strong college community of environmental analysts and to draw upon the expertise of scholars at Syracuse University. Entering students are required to complete the equivalent of the GPES master's core either from prior graduate study or coursework taken within the first year of residency.

The Ph.D. in Environmental and Natural Resources Policy (ENRP) has separate and distinct requirements (discussed below). Also, applicants are expected to have completed a master's research thesis.

Graduate Areas of Study

Biophysical and Ecological Economics (M.S., M.P.S., Ph.D.)

Students in the Biophysical and Ecological Economics (BEE) study area develop an understanding of environmental problems and solutions through analyses of the relations between the human economy of goods and services and the biophysical economy of networks of energy and material resource flows.

Drawing on insights from social and physical sciences, BEE helps students to develop critical thinking, intellectual approaches, measurement tools and modeling skills for analyzing increasingly important topics in environment and natural resource science and policy. Specific course work in biophysical and ecological economics is supplemented by course work in ecology, resource management, environmental economics, policy analysis and others.

Coupled Natural and Human Systems (M.S., M.P.S., Ph.D.)

The Coupled Natural and Human Systems (CNHS) area of study fosters interdisciplinary research and scholarship that explicitly integrates the social and biophysical dimensions of environmental issues using a systems approach.

Our research addresses the challenges of sustaining natural and social capital during the Anthropocene—the current era in which humans shape all major Earth system processes. Drawing on diverse backgrounds, CNHS students and faculty recognize humans as integral components of ecosystems and seek to understand their interactions and dynamics of change at multiple scales. Faculty mentors form collaborative and cross-disciplinary teams to advise CNHS students based on their wide range of expertise and experiences. An emphasis is placed on research and graduate training experience with applications to emerging sustainability issues in real-world settings.

Ecosystem Restoration (M.S., M.P.S., Ph.D.)

The ecosystem restoration study area focuses on the technical, biogeochemical, ecological and cultural aspects of rehabilitating and restoring degraded ecosystems, habitats and landscapes.

The program is designed for graduate students who wish to take an interdisciplinary approach to ecosystem restoration, have access to multidisciplinary expertise, and develop advanced knowledge of ecological engineering, conservation biology, restoration ecology, forest and habitat restoration, landscape ecology and eco-cultural restoration to address complex environmental problems. Current research includes urban ecology and renewal, aquatic restoration, invasive species, agroforestry, brownfields, traditional ecological knowledge and the spatial monitoring, modeling and analysis of integrated ecological processes. Field sites and study areas are located throughout the world and involve a wide variety of ecosystems, cultures and landscapes. Specific course work in ecosystem restoration is supplemented by courses offerings in science, engineering, mathematics, natural resources, and environmental and social policy.

Environmental Communication and Participatory Processes (Ph.D. only)

This Ph.D. study area addresses the communicative dynamics of behaviors, attitudes, values, perceptions, and ideologies. It includes decision making, public policy, public participation, campaign development, organizational effectiveness, conflict prevention and resolution, and risk communication which all hinge on the ability of participants to communicate and use information effectively, strategically, and ethically.

GPES students within this option will be prepared to enter diverse arenas of academia, industry, non-government organizations, and government structures well equipped to facilitate and/or participate in interactions among individual citizens, non-government organizations, publics, agencies, bureaucracies, scientists, and others. They will have the skills and knowledge that will allow them to choose appropriate process structures and strategies to reach objectives.

Environmental and Community Land Planning (M.S., M.P.S., Ph.D.)

The program is designed for students with social science, natural science, engineering, or design backgrounds who are interested in an interdisciplinary and integrative program. Some students have majors in interdisciplinary programs in urban studies or environmental studies. Students develop an understanding and knowledge of development processes, natural systems and governmental planning and regulation. They develop a capacity to analyze environmental and community land planning problems and to form imaginative solutions. Skills obtained include preparation of land and environmental databases, plans, policies and implementation programs.

Environmental Monitoring and Modeling (M.S., M.P.S., Ph.D.)

This study area focuses on multidisciplinary approaches to measuring and modeling environmental systems and processes.

Students address pressing environmental problems in an integrative manner by taking advantage of a broad range of faculty expertise, a variety of course offerings related to the environment and access to advanced field equipment, study sites and computational hardware. Current research in this area includes sustainable development, air quality, water resources, biogeography, terrestrial and aquatic ecosystems, climate and anthropogenic change, forest biometrics and energy systems. Specific course work in environmental monitoring and modeling is supplemented by courses offerings in the fields of science, engineering, mathematics, natural resources and environmental and social policy.

Environmental and Natural Resources Policy (Ph.D. only)

The Environmental and Natural Resources Policy (ENRP) doctoral program is an interdisciplinary Ph.D. program in that it combines social science (especially policy) with biophysical science.

The problems we study are grounded in the biophysical world, most specifically with the human impact on biophysical systems and vice versa. Investigating these problems requires scientific understanding of the interconnections between ecosystems and social systems; the skills developed in the ENRP program help our graduates to creatively and appropriately design managerial and policy solutions, as well as conduct research studies.

Human Dimensions of the Environment (M.S., M.P.S., Ph.D.)

Human Dimensions of the Environment deals with people's relationships and interactions with the biophysical world. This area incorporates knowledge from both the social and biophysical sciences to examine system interactions.

Research in this area works toward (1) understanding human perceptions, behaviors, attitudes and values with respect to natural resources and the environment; and (2) applying empirical findings to the development of social and biophysical science theory as it relates to human interactions with natural and constructed environments.

Water and Wetland Resource Studies (M.S., M.P.S., Ph.D.)

The water and wetland resources area of study focuses on technical, social, and institutional aspects of water resources management, water quality issue mitigation, and water system restoration.

Individual students may emphasize biophysical or social science subject areas but all study in both areas. The biophysical science aspects include the physical, chemical and biological interactions occurring in water systems. The social science aspects are concerned with planning, regulation, law and institutions, and management of water and wetland resources.

Recommended coursework includes:

- physical sciences: civil engineering, geology, geomorphology, hydrology, meteorology, environmental engineering, soils, water chemistry, hydrogeology, hydrogeochemistry and geographic information systems;
- biological sciences: ecology, entomology, fisheries biology, forestry, microbiology, water quality and limnology;
- social sciences: administration, economics, government, history, law, ethics, philosophy and policy.

* **Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) **G** =

*General Education Course (GenEd), **E** = Engineering, **ES** = Engineering Sciences, **M** = Mathematic, **NS** = Natural Sciences, **PE** = Professional Education, **S** = Summer-only*

DEPARTMENT OF ENVIRONMENTAL STUDIES

Theresa Selfa, Chair

106 Marshall Hall

315-470-6636

315-470-6915 (fax)

The [Environmental Studies](#) program emphasizes interdisciplinary social science, humanities and natural science approaches to environmental understanding and stewardship.

ES programs maintain a strong academic orientation, facilitating student and faculty engagement with fundamental environmental challenges and dynamics such as multiple and conflicting levels of environmental governance, participatory democracy, sustainable development, uses and limits of scientific prediction, discourses of environment, cultural expressions of nature, risk, and ecological sustainability.

BACHELOR OF SCIENCE IN ENVIRONMENTAL EDUCATION AND INTERPRETATION

[Environmental Education](#) teaches people of all ages about the natural environment, so that they can make informed decisions on how to care for it.

Interpretation is a communications process that reveals meanings and relationships about natural, cultural, historical, and recreational resources. Interpretation and environmental education work hand-in-hand to help make connections between the world of science and the public. Through the art of interpretation, students will learn how to help people make connections with the natural world and science through educational programs and materials.

Required Courses

APM 104

OR

APM 105

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

EFB 120

EFB 210

EFB 211

EFB 320

EST 132

EST 133

EST 361

EST 370

EST 407

EST 415

EST 444

EST 471

EST 494

EST 499

3

EWP 190

EWP 290

FCH 150

FCH 151

FOR 372

Electives

Course	Codes*	Credits
General Education Course in one of the following categories:The Arts, Western Civilization, Other World Civilizations, Foreign Language	G	3
Directed Electives		30
Open Electives		24

Directed Electives: Environmental Education & Interpretation

A. Conservation Biology and Resource Management

At least 6 credits hours must be in the subject area of advanced conservation biology and Management. Allowable courses are listed below. The list may vary slightly from year to year.

- EFB 370 Population Ecology and Management
- EFB 390 Wildlife Ecology & Management (4 cr.) F
- EFB 413 Introduction to Conservation Biology (4 cr.) S
- EFB 423 Marine Biology (4 cr.) S even years
- EFB 487 Fisheries Science and Management (3 cr.) F
- EST 220 Urban Ecology (3 cr.) F
- FOR 332 Forest Ecology (4 cr.) F
- FOR 404 Ecotourism Abroad (3 cr.) S
- FOR 475 Recreation Behavior and Management (3 cr.) F
- FOR 476 Ecotourism and Nature Tourism (3 cr.) F

B.Advanced Communication

At least 6 credit hours must be in the subject area of advanced communication. Allowable courses are listed below. The list may vary slightly from year to year.

- EST 395 Public Communication of Science and Technology (3 cr.) S
- EST 493 Environmental Communication Workshop (3 cr.) S
- EWP 390 Literature of Nature (3 cr.) F, S
- EWP 394 The Art of Storytelling (3 cr.) F
- EWP 407 Writing for Environmental and Science Professionals (3 cr.) F, S
- EWP 420 Public Presentation Skills (3 cr.) F, S
- EWP 450 Digital Storytelling (3 cr.) F, S
- EWP 494 Creative Non-fiction in the Sciences (3 cr.) S
- LSA 300 Digital Methods and Graphics I (3 cr.) F

C.Advanced Environmental Education and Interpretation

At least 3 credit hours must be in the subject area of advanced interpretation. Allowable courses are listed below. The list may vary slightly from year to year.

- EST 333 Inquiry-Based Science Education (3 cr.) S
- EST 472 Natural History Museums and Modern Science (3 cr.) Maymester
- EST 474 Advanced Interpretation and Environmental Education (3 cr.) S

D. Organismal Diversity

To encourage breadth in organism-level biology, students must complete 12 credit hours in any combination from this list.

- **Environmental Biology**
 - EFB 202 Ecological Monitoring & Bio Assess (3 cr.) CLBS Summer
- **Earth Sciences**
 - EST 231 Environmental Geology (3 cr.) S
 - FOR 338 Meteorology (3 cr.) S
 - FOR 340 Watershed Hydrology (3 cr.) S
 - FOR 345 Introduction to Soils (3 cr.) F
 - FOR 442 Watershed Ecology and Management (3 cr.) F
 - Diversity of Microorganisms
 - EFB 303 Introductory Environmental Microbiology (4 cr.) F
 - EFB 340 Forest and Shade Tree Pathology (3 cr.) S
 - EFB 342 Fungal Diversity and Ecology (3 cr.) CLBS
 - EFB 428 Mycorrhizal Ecology (3cr.) F, even years
 - EFB 440 Mycology (3 cr.) F
- **Diversity of Plants**
 - EFB 326 Plant Evolution, Diversification and Conservation (3 cr.) S
 - EFB 327 Adirondack Flora (3 cr.) CLBS
 - EFB 336 Dendrology (3 cr.) F
 - EFB 337 Field Ethnobotany (3 cr.) CLBS
 - EFB 435 Flowering Plants: Diversity, Evolution, and Systematics (3 cr.) F
 - EFB 446 Ecology of Mosses (3 cr.) S
 - EFB 496 Flora of Central NY (3 cr.) Maymester
 - EFB 496 Wetland Plants & Communities of Adirondacks (3 cr.) CLBS
- **Diversity of Invertebrate Animals**
 - EFB 351 Principles of Forest Entomology (3 cr.) S
 - EFB 352 Elements of Entomology (3 cr.) F
 - EFB 355 Invertebrate Zoology (4 cr.) S
 - EFB 453 Parasitology (3 cr.) F
 - EFB 554 Aquatic Entomology (3 cr.) F
- **Diversity of Vertebrate Animals**
 - EFB 388 Ecology of Adirondack Fishes (3 cr.) CLBS
 - EFB 482 Ornithology (4 cr.) S
 - EFB 483 Mammal Diversity (4 cr.) F
 - EFB 484 Winter Mammalian Ecology (3 cr.) S
 - EFB 485 Herpetology (3 cr.) S
 - EFB 486 Ichthyology (3 cr.) S

E. Diversity, Equity, Inclusion and Social Justice

At least 3 credit hours are required in this subject area related to the inclusion of diverse perspectives in Environmental Education and Interpretation.

- Refer to general education list for DEISJ approved courses

Total Minimum Credits For Degree: 123

BACHELOR OF SCIENCE IN ENVIRONMENTAL STUDIES

Students may enter the Bachelor of Science program as first-year students or as transfer students. Students who are preparing to transfer to ESF as juniors must have earned at least 60 credits of college coursework, in courses comparable to the lower-division course requirements as noted below.

In the first two years of the program, students develop a foundation in the social sciences, humanities, and natural sciences as they relate to environmental affairs. During that time, students also fulfill SUNY general education requirements and take some open elective courses.

Option Areas

In the final two years of the program, students must select one of three specializations called Option Areas.

Environment, Communication and Society

This option focuses on how communication and social systems influence environmental affairs and shape our perceptions of the non-human world. It addresses the subjects of rhetoric and discourse; news media; public participation; advocacy campaigns; collaboration; conflict resolution; risk communication; social processes; and representations of nature in literature and popular culture.

Environmental Policy, Planning and Law

This option is concerned with how environmental policies, plans, and laws from the local to the global are created, implemented and contested. It emphasizes legislative, regulatory, and collaborative approaches to addressing environmental issues.

Natural Systems Applications

This option is designed for students interested in the interface between biology and socio-economic issues. It provides an emphasis on natural systems and their interactions with societal issues ranging from education to habitat management.

Lower Division Environmental Studies Core Courses

APM 103

OR

APM 104

OR

APM 105

EFB 100

OR

EFB 101

AND
EFB 102

EFB 103
AND
EFB 104
OR
EST 231

EFB 120

ESF 200

EST 132

EST 133

EST 221

EST 245

EST 255

EWP 190

EWP 220

EWP 290

FCH 110
AND
FCH 111
OR
FCH 150
AND
FCH 151

FOR 207

Lower Division Electives

Course	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3

General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Directed Electives		27
Open Electives		18

Upper Division Environmental Studies Core Courses
APM 391

EFB 320

OR

FOR 232

OR

EST 220

OR

FOR 442

OR

LSA 321

EST 321

EST 361

EST 494

EWP 407

Senior Synthesis

Upper Division Electives

Course	Codes*	Credits
Upper Division Computing OR Natural Science Course		

Environment, Communication and Society Option
EST 390

EST 395

EST 493

Choose two of the following five courses: EWP 495, EWP 420, ESF 6300, EFB 417, EFB 312

Option Courses (Including 3 credits in Methods) 15

Environmental Policy, Planning and Law Option
EST 550

Method Courses 6

Law Option Courses 3

Planning Option Courses 3

Environmental Policy/Planning/Law Option Courses 15

Natural Systems Applications Option

Course	Codes*	Credits
Field Methods GIS (Required)		3
Field Methods Scientific Breadth		3
Natural Applications Suboptions Natural Systems		3
Natural Applications Suboptions Environmental Quality		3
Social Science Policy or law courses		9
Social Science Communication courses		6
Social Science Critical Issues in the Environment		3

Total Minimum Credits For Degree: 122-125 (total credits must include a minimum of 51 credit hours at the 300 level or above)

GRADUATE PROGRAMS

The Department of Environmental Studies offers degree and certificate programs in environmental studies, science, and policy, as well as interdepartmental master's and Ph.D. options.

Programs integrate and balance the social sciences, humanities, and natural sciences in creative, interdisciplinary contexts.

Advanced Standing

- i. **Course transfers.** A maximum of six graduate credit hours with a grade of "B" or better that have not been applied to another degree may be transferred via Petition. The Petition must include an attached syllabus, and a justification of how the courses are to be included on the student's Plan Sheet. Petitions for course transfers are submitted following matriculation.
- ii. **Credit for prior experience** (M.P.S. degree only). Applicants with a minimum of three (3) years of post-baccalaureate, full-time professional experience directly related to the intended area of study may apply for 6 credit hours of advanced standing in the M.P.S. program. Partial credit for experience cannot be awarded. When awarded for prior work experience, the 6 credit hours are applied toward the Synthesis requirement.

Master of Science (M.S.)

M.S. Program Requirements

The Environmental Studies M.S. degree program is a 30-credit-hour experience focused on advanced academic scholarship and research related to environmental affairs and sustainability. This degree requires the completion of a Master's thesis. Details on thesis proposals and expectations are available in the M.S. in Environmental Studies student handbook. All students must present a Capstone Seminar during their final semester. If necessary, the distribution of required credits may be adjusted to take into account a student's prior academic work and background. It is recommended that students entering this program have some academic background in Environmental Policy or Communication, and Environmental Science or Ecology.

Core Courses (9 credits)

EST 600

All students also take at least two of the following:

Elective Courses

EST 608

EST 612

EST 613

EST 615

EST 640

EST 645

EST 650

EST 708

EST 770

Research Methods (6 credits)

All students take:

Core Courses

EST 603

And one additional research methods course, typically from the following list and typically to support their thesis research:

Elective Courses

APM 510

APM 625

APM 630

EST 604

EST 605

EST 617

EST 702

EST 705

LSA 640

NOTE: Other research methods courses may be identified in collaboration with the student's advisor.

Generalized / Thematic Area (9 credits)

All students take three courses--typically in a thematic area--in consultation with their major professor. The thematic area should be used to substantively prepare the student for thesis work. EST 898 and EST 899 may not be included as thematic area courses.

Thesis Research (6 credits)

All students with an approved thesis proposal take at least six credits of:
EST 899. Master's Thesis Research

Master of Professional Studies (M.P.S.) in Environmental Studies

The M.P.S. in Environmental Studies degree program is a 30-33 credit-hour experience focused on advanced academic scholarship and its application to environmental affairs and sustainability. This degree requires the completion of a synthesis experience, often involving an individual or group-based professional internship. All students must present a Capstone Seminar during their final semester. See your advisor or the Department Office for information on procedures and deadlines for setting up the Capstone Seminar. The distribution of required credits may be adjusted to take into account a student's prior academic work and background. All courses are 3 credit hours unless noted otherwise. It is recommended that students entering this program have some academic background in Environmental Policy or Communication, and Environmental Science or Ecology.

M.P.S. Program Requirements

Core (12 credits)

Four courses cover the disciplinary and methodological scope of the field and demonstrate its applicability to problem analysis and the quest for sustainability. For full-time students, these courses are usually taken in the first year of the program; Part-time students may take these courses over multiple years. These courses provide a basis of common knowledge among students in the MPS program.

Required Courses

EST 600

AND three of the following:

These are the recommended courses to help develop the fundamental knowledge and skill set for Environmental Studies:

Required Courses

EST 606

EST 608

EST 612

EST 613

EST 615

EST 616

EST 624

EST 635

EST 640

EST 645

EST 650

EST 652

EST 708

EST 770

Alternate courses may be identified in collaboration with the student's advisor.

Natural Sciences (3 credits)

At least one natural science course is required in order to enhance the student's existing knowledge. Typically this would be one of the following courses, though alternatives may be considered in consultation with the student's advisor.

Required - 1 course chosen from:

Required Courses

EFB 518

EFB 523

EFB 600

EFB 611

EFB 623

EFB 650

FOR 538

FOR 642

FOR 680

SRE 525

SRE 535

Research / Technical Methods (3 credits)

At least one research or technical methods course is required to provide skills necessary to apply environmental knowledge and pursue the synthesis experience for the MPS. Typically this would be one of the following, but an alternative course may be selected in consultation with the student's advisor.

Required - 1 course chosen from:

Elective Courses

APM 510

APM 625

APM 630

ENS 519

ERE 551

EST 550

EST 570

EST 603

EST 604

EST 617

EST 627

EST 671

EST 702

EST 705

FOR 557

FOR 659

LSA 500

LSA 501

LSA 552

LSA 640

LSA 650

SRE 679

Generalized / Thematic Area (9 credits)

Three additional courses are selected in consultation with the student's Steering Committee. The Generalized or Thematic Area courses are used to prepare the student for capstone synthesis work and post-graduation work opportunities by enhancing a solid knowledge of some aspect of Environmental Studies. Course selection is determined through the Graduate Program of Study;

students will be encouraged to include courses in their plans of study that enhance their career goals. EST 898 and EST 899 may not be included as Generalized or Thematic Area courses.

Synthesis (3-6 credits)

In order to synthesize and apply their knowledge of Environmental Studies, all students take 3-6 credit hours of one of the following:

- EST 798 Problems in Environmental Studies (3-6 cr, Synthesis Paper)
- EST 898 Professional Experience (6 cr, Internship)

OR successfully complete a group research project or internship via enrollment in a graduate-level course with such a focus (3-4 cr), such as EST 690, International Environmental Policy Consultancy.

Master of Professional Studies (M.P.S.) in Environmental Leadership, Justice, and Communication

M.P.S. Program Requirements
EST 555

EST 606

EST 608

EST 612

EST 615

EST 616

EST 617

EST 635

EST 640

EST 798

OR

EST 898

Certificate of Graduate Study in Environmental Decision Making

The Certificate of Graduate Study in Environmental Decision Making is designed is designed for graduate students at ESF and those enrolled in law, management, public administration, or information studies programs at Syracuse University. It provides an exposure to specialized environmental study that is relevant to students with related professional interests. The focus of this certificate is on environmental decision making, the processes by which stakeholders seek solutions to environmental problems.

Student Eligibility

Graduate students currently matriculated and in good academic standing in their graduate degree programs at SUNY ESF and Syracuse University are eligible to apply for entrance to the certificate program.

Administrative Procedures

Application and admissions procedures, compliance with college requirements for successful graduate study and the awarding of certificates are all administered by ESF's Dean of Instruction and Graduate Studies, 227 Bray Hall. If enrollment limitations are established, acceptances will be made on a rolling basis, according to the date of receipt of applications.

Certificate Program Requirements

Core Courses

EST 635

Choose 9 credits from the following two lists*, at least one course from each:

Environmental Policy and Law

EST 609

EST 612

EST 615

EST 660

EST 702

EST 705

EST 770

EST 796

FOR 687

FOR 689

LAW 716

LAW 865

PAI 775

PAI 777

SRE 622

Human and Environment Interactions

EST 606

EST 608

EST 613

EST 624

EST 640

EST 645

EST 650

EST 750

EST 708

LSA 650

PAI 730

*Alternate courses may be substituted in these two areas, by petition.

Certificate of Advanced Study in Environmental Leadership

The graduate certificate of advanced study in Environmental Leadership equips decision-makers, managers, facilitators, advocates, and community leaders with the skills and understanding to address complex environmental challenges. Participants in the program will develop their capacities to find common ground among diverse points of view, to advance decision making that considers both scientific knowledge and deeply held values, and to facilitate cooperation across social, organizational, and administrative boundaries.

All students take

EST 640

EST 612

EST 635

Certificate of Advanced Study in Science & Environmental Communication and Public Relations Management

The certificate of advanced study in Science and Environmental Communication and Public Relations Management prepares current and future environmental professionals, decision-makers, and engaged citizens to communicate effectively, as well as to analyze and assess factors influencing public perceptions of environment, science, and risk. Effective communication and dialogue in environmental decision-making is emphasized, as participants learn to develop, engage, and evaluate audience-centered communication strategies that respond to points of convergence and conflict.

All students take

EST 555

EST 606

EST 608

Certificate of Advanced Study in Environmental Justice and Inequality

The Certificate of Advanced Study in Environmental Justice and Inequality is designed to equip people interested in social and justice issues, including environmental professionals, community leaders, and advocates, with the analytical skills to deeply engage existing research and evidence on the unique environmental vulnerabilities faced by marginalized communities. This engagement uses a theory and case-based grounding in the structural and systemic factors that generate and perpetuate these inequities. The program's interdisciplinary approach includes tools and methods drawn from geography, sociology, environmental and public health, policy and law, sustainability science, and critical race theory. It builds upon these frameworks to develop new strategies for equitable and liberatory practice.

All students take

EST 615

EST 616

EST 617

* **Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) **G** = General Education Course (GenEd), **E** = Engineering, **ES** = Engineering Sciences, **M** = Mathematic, **NS** = Natural Sciences, **PE** = Professional Education, **S** = Summer-only

DEPARTMENT OF LANDSCAPE ARCHITECTURE

M.Margaret Bryant, Chair

101 Marshall Hall
315-470-6544

Since 1911 the Landscape Architecture program at SUNY ESF has been educating practitioners and teachers, designers and planners, advocates and policy makers who have devoted careers to a viable, sustainable integration of natural and cultural communities.

The [Department of Landscape Architecture](#) offers three degree programs designed to educate students to contribute in varied ways to society and the wise use of land and landscape. Each provides a basis for students to establish career directions in the profession of landscape architecture and related fields. The bachelor and Master of Landscape Architecture, and master of science degrees are offered. Qualified undergraduate students may apply for the combined B.L.A./M.S. fast-track option.

Students in the department are required to have a laptop computer with appropriate software. Guidelines are available from the Department of Landscape Architecture. Many classes also have required field trips to project sites, or to study built works. Course fees attached to such classes cover transportation. Course fees also cover supplies for final plots for class assignments.

BACHELOR OF LANDSCAPE ARCHITECTURE

The B.L.A. program is designed for those students desiring to enter the profession of landscape architecture either directly after completing the degree or after completing graduate school. This is a professional degree with an emphasis on the skills and knowledge required to qualify as a landscape architect.

Accreditation

The degree is accredited by the Landscape Architectural Accreditation Board (LAAB).

The B.L.A. degree is granted at the end of five years of study and requires the successful completion of 141 credit hours. Students are accepted into the lower-division landscape architecture program as freshmen or as sophomore transfers and into the upper-division program as junior transfers.

Lower Division Required Courses

APM 103

EFB 100

ESF 200

EWP 190

EWP 220

EWP 290

LSA 132

LSA 182

LSA 206

LSA 212

LSA 220

LSA 226

LSA 227

LSA 300

LSA 301

LSA 305

LSA 311

LSA 333

Electives

Course	Codes*	Credits
General Education Course: Social Sciences	G	3
General Education Course select one: World History and Global Awareness, World Languages, US History & Civic Engagement	G	3

Upper Division Required Courses EWP 407

LSA 312

LSA 321

LSA 326

LSA 327

LSA 342

LSA 343

LSA 422

LSA 423

LSA 424

LSA 425

LSA 433

LSA 451

LSA 455

LSA 458

LSA 459

LSA 460

LSA 461

LSA 470

Free Electives

15

Total Minimum Credits For Degree: 141*

*curriculum pending NYSED approval

B.L.A./M.S. FAST TRACK

This option is available to outstanding fourth-year bachelor of landscape architecture students and provides the opportunity to receive both the bachelor of landscape architecture and master of science degrees during a six-year period at the College. Students who apply must have a minimum 3.000 GPA and are accepted into the program during the fall semester of the fourth year of the bachelor of landscape architecture program. The transition between the bachelor of landscape architecture and master of science curriculum requirements begins in the fall of the fifth year. The B.L.A. degree is awarded on completion of all professional requirements and a minimum of 141 credit hours. The M.S. degree is awarded after the completion of 30 graduate credits and successful completion of a research thesis. Depending on the student's needs and research interests, there are two options available for pursuing an off-campus semester or a field research component. The first option (option A) allows students to pursue the off-campus semester with their undergraduate peers. The second option (option B) links the off-campus semester to graduate field research for their theses.

Fast-Track Option A – Summer start

Fourth Year, Summer option only
LSA 458

LSA 459

LSA 460

Fifth Year (25-28 credits)
LSA 455

LSA 461

LSA 470
OR
LSA 670

LSA 596

LSA 640

LSA 697

Audit

LSA 799

Directed Electives

6 - 9

B.L.A. program completed with a minimum of 141 credits earned

Sixth Year (12-24 credits)
LSA 899

Directed Electives

6 - 12

Students may register for LSA 899 Master's Thesis Research as necessary for completion up to the time limit of the M.S. program. Minimum of 6 credits required.

B.L.A./M.S. fast-track program completed with a minimum of 171 credits hours of which a minimum of 30 credit hours must be graduate level courses.

Fast-Track Option B – Fall start

Fifth Year (24-27 credits)
LSA 455

LSA 470
OR
LSA 670

LSA 596

LSA 625

Audit

LSA 640

LSA 697

Audit

Directed Electives

6 - 9

Fifth Year, Summer (6-12 credits)
LSA 760
OR
LSA 798

6 credits of LSA 798 may be taken to fulfill this requirement. LSA 760 or LSA 798 must be linked to thesis.

B.L.A. program completed with a minimum of 141 credits

Sixth Year (18-24 credits)
LSA 899

Graduate-level Directed Electives

6 - 12

Students may register for LSA 899 Master's Thesis Research as necessary for completion up to the time limit of the M.S. program. Minimum of 6 credits required.

B.L.A./M.S. fast-track program completed with a minimum of 171 credits, of which a minimum of 30 credits must be graduate level courses.

MASTER OF LANDSCAPE ARCHITECTURE (M.L.A.)

The degree is accredited by the Landscape Architectural Accreditation Board (LAAB).

A three-year program for applicants who have no design or planning background leads to the fully accredited professional degree of master of landscape architecture (M.L.A.). This program is for students who intend to complete coursework full time. Applicants with a related design or planning degree may enter the three-year program with advanced standing.

The M.L.A. program, for the student seeking a first professional degree in landscape architecture, is a more tightly structured curriculum because it leads to the prerequisite work experience that qualifies the graduate for the Landscape Architecture Registration Examination (L.A.R.E.).

M.L.A. Program Requirements

LSA 500

LSA 501

LSA 552

LSA 600

LSA 601

LSA 605

LSA 611

LSA 615

LSA 620

LSA 632

LSA 633

LSA 640

LSA 645

LSA 650

LSA 651

LSA 655

LSA 670

LSA 697

LSA 700

LSA 799

LSA 800

Final Integrative Experience

M.L.A. students must complete an integrative experience. Students must participate in the capstone studio and complete a 6-credit independent design project during the final semester of the program. M.L.A. students must disseminate the results of their integrative studies through capstone seminars.

The M.L.A. program requires 70 credit hours.

Master of Science (M.S.)

Because the M.S. program serves the advanced professional, course requirements do not address foundation professional courses in landscape architecture. However, the student, in consultation with the major professor and steering committee, has great flexibility in developing a program of study suited to career goals in the chosen area of study.

M.S. Program Requirements

LSA 640

LSA 697

LSA 799

LSA 899

Students may register for LSA 899 Master's Thesis Research as necessary for completion up to the time limit of the M.S. program. Minimum of 6 credits required.

Final Integrative Experience

M.S. students must complete an integrative experience and must complete a thesis (6 credits). The thesis may be research in which new, original knowledge is generated, it may be a study that focuses on the application of existing knowledge to a new situation, or it may combine both elements. Students must disseminate the results of their integrative studies through capstone seminars.

Areas of Study

The landscape architecture graduate degree programs provide a well-balanced curriculum in landscape architectural design and planning, coupled with opportunities to pursue individualized advanced study in a broad range of topics.

The diversity of faculty interests and expertise offer both M.L.A. and M.S. students opportunities for in-depth exploration in three areas of study: community design and planning, cultural landscape conservation, and landscape and urban ecology.

Community Design and Planning (M.L.A., M.S.)

The purpose of this area is to address design, planning and research with regard to human settlements including discrete traditional communities such as cities, towns, hamlets, and their hinterlands; regional and rural communities connected to agriculture, watersheds and forests; and specialized communities such as institutional and corporate campuses, co-housing and new towns.

Cultural Landscape Studies and Conservation (M.L.A., M.S.)

This area addresses a range of issues germane to the developmental and interpretive history of the cultural landscape. At its most fundamental level, the study area prepares students to address preservation planning and management for a range of cultural landscape types including historic sites and settlements, designed landscapes and vernacular landscapes.

There is also a growing set of interdisciplinary methods relevant to cultural landscape studies such as critical history, landscape representation, media, visual perception and reception of landscapes, interpretation, narrative and participatory design. Graduate students may explore and/or integrate these methods with design and preservation practices.

Landscape and Urban Ecology (M.L.A., M.S.)

The purpose of this area of study is to address a range of theoretical and practical applications in landscape and urban ecosystems as they relate to the practice of landscape architecture and community design.

In this contemporary interdisciplinary approach, students will learn about the structure, heterogeneity and ecological processes of a broad range of natural, modified and urban landscapes. People are recognized as an integral part of the landscape and are included as a major focus of research and practice.

Doctoral Level Studies

Doctoral level studies in landscape architecture may be tailored in connection with the interdisciplinary Ph.D. program in the Graduate Program in Environmental Science (GPES). Please see The Division of Environmental Science section of this catalog.

*** Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) G = General Education Course (GenEd), E = Engineering, ES = Engineering Sciences, M = Mathematic, NS = Natural Sciences, PE = Professional Education

ESF OPEN ACADEMY

Dr. Darshini Roopnarine, Director

315-470-6810

The ESF Open Academy is an academic unit that encompasses the College's outreach programs including online education, summer semester, professional and public education, and visiting student support.

To these ends, ESF faculty, staff and students, along with our partners, pursue a diverse range of programs and projects—all with an aim to enhance leadership, education, and practice in the science, design, engineering and management of natural resources and the environment. Programs include on-campus, off-campus, and online credit and non-credit opportunities for professionals, middle and high school students, ESF students, and lifelong learners.

BACHELOR OF SCIENCE IN SUSTAINABILITY MANAGEMENT

The Bachelor of Science in Sustainability Management (SM) is a fully online Bachelor of Science completion program (in effect, the third and fourth program years) that integrates discipline- and career-focused knowledge, skills, and perspectives based on the three pillars of sustainability: economics, society, and the environment. Emphasis is placed upon understanding how key environmental dimensions of sustainability are interdependent with socially and economically viable policies and practices. This program builds upon a broad and flexible foundation at the lower division with specialized sustainability college coursework at the upper division. Students synthesize knowledge and skills and strengthen workforce-readiness through a capstone project. The program's upper division sustainability coursework prepares graduates for a wide and expanding range of career positions in the public, private and non-profit sectors.

Lower Division Required Courses

Lower Division Courses are expected to be completed prior to matriculation in the Sustainability Management degree program.

Course	Codes*	Credits
Physical/Natural Science Elective		3
Introduction to Sustainability		3
Ecology		3 - 4
College Algebra or Higher		3
Probability & Statistics		3
Economics		3
English with a focus on Writing 1		3
English with a focus on Literature		3
Public Speaking		3
DEISJ General Education Course		3
Sociology		3
Free Electives		21

Total Lower Division Credits Required: 60 – 61

Lower Division Courses are expected to be completed prior to matriculation in the Sustainability Management degree program.

<i>Elective</i>		
GENEDU	General Education Elective	3
GENEDU	General Education Elective	3

Upper Division Required Courses

SUS 300

SUS 310

SUS 320

SUS 330

SUS 340

SUS 350

SUS 360

SUS 400

SUS 410

SUS 420

SUS 430

SUS 440

SUS 450

SUS 480

Upper Division Elective

Course	Codes*	Credits
Upper Division Elective Courses		18

Total Upper Division Credits Required: 60

Total Minimum Credits For Degree: 120

DEPARTMENT OF SUSTAINABLE RESOURCES MANAGEMENT

Chris Nowak, Chair

319 Bray Hall
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315-470-6535 (fax)
canowak@esf.edu

Our mission in SRM is to advance our understanding of current environmental issues through cutting edge research, education, and outreach, with a special focus on sustainably managing renewable, natural and constructed resources, including energy, forests, recreation, soils, water, and building materials, to provide short- and long-term benefits with and for people. With a group of internationally known faculty, we address these issues both locally and nationally, across a range of scales through both applied and fundamental research, technology transfer and teaching.

The department offers programs leading to bachelor's, master's and doctoral degrees at the main college campus in Syracuse, N.Y., and three programs leading to the associate in applied science (A.A.S.) degree at The Ranger School in Wanakena, N.Y. See the Ranger School for information about the associate of applied science degrees in forest technology, land surveying technology, and environmental and natural resources conservation.

Undergraduate Programs

Sustainable Resources Management programs prepare students for work with public and private sector organizations and consultancies, and for further professional or scientific study at the graduate level.

Summer Program

The Summer Program is required for all B.S. degree candidates in FES, FRM and NRM. The program is a four-week session that begins at the end of May and lasts through late June. It is taught at ESF's Wanakena Campus in the Adirondacks. The program consists of one course: FOR 304 Adirondack Field Studies. Students must complete the summer program before the junior year. Students who completed an A.A.S. degree from the ESF Ranger School meet this requirement through transfer credits.

BACHELOR OF SCIENCE IN CONSTRUCTION MANAGEMENT

Construction Management prepares students to work in an integrated team with a diverse group of owners, architects, engineers, construction craftspersons, and material suppliers. The manager helps to ensure that the owner's goals for cost, schedule, quality, and sustainability are met. Students may enter the Bachelor of Science program as first-year students or as transfer students. Our graduates have excellent placement rates and starting salaries.

The Bachelor of Science degree in Construction Management at ESF is distinguished by a strong emphasis on project-based learning, a unique focus on sustainability, a hands-on laboratory environment, and a strong relationship with Syracuse University.

- Students are engaged each semester in classes, clubs, and competitions that allow them to take on responsibility and deliver projects for the campus and community. Whether building bridges or tiny homes, planning net zero projects for displaced residents or autistic children, CM students are building our future. To read how the CM students won a national prize for their work, and then helped the project be built.
- ESF is a leader in sustainability, and the Construction Management program is no different. Our CM students take multiple courses on sustainability, and a majority take and pass the LEED Green Associate exam. CM students help to organize and run the NYS Green Building Conference, where they meet and engage with professionals on the cutting edge of the industry.
- The green building materials lab, the wood machining lab, and the material testing lab give students the hands-on experience to understand the materials and processes used for construction.
- ESF construction managers work alongside Syracuse University architects and engineers on integrated team projects and competitions. ESF Construction Management students taking classes at Syracuse University find themselves working with students from Real Estate, Management, Architecture, and Civil Engineering majors.

The educational program, leading to the professional Bachelor of Science degree in Construction Management, is accredited by the American Council for Construction Education.

Lower Division Required Courses

APM 104

APM 105

CME 132

CME 215

CME 226

CME 106

CME 332

CME 142

EWP 190

EWP 220

EWP 290

FCH 110

FCH 111

FOR 205

FOR 207

FOR 360

PHY 211

PHY 221

General Education Courses

Course	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses

APM 391

CME 255

CME 303

CME 305

CME 327

CME 331

CME 335

CME 343

CME 404

CME 405

CME 453

CME 454

CME 455

CME 497

ERE 371

FOR 485

RMS 387

RMS 422

Free Electives

Course	Codes*	Credits
Electives		18

Total Minimum Credits For Degree: 124

BACHELOR OF SCIENCE IN FOREST ECOSYSTEM SCIENCE

The [Forest Ecosystem Science](#) degree is based on a vision that combines professional competency in forest management skills with an enhanced understanding of ecological sciences. Students interested in this program typically are drawn to natural settings and environments, enjoy nature, and want to understand how forested ecosystems work. ESF provides a wide variety of opportunities to meet student needs utilizing 25,000 acres of forest lands as teaching laboratories. Internships with natural resource-based organizations in the business, public and nonprofit sectors provide additional hands-on experiences. Experiential field learning is combined with learning concepts and skills in the classroom and laboratory on ESF's Syracuse campus.

The undergraduate curriculum in forest ecosystem science consists of two broad categories of courses. The first category, general education, provides students with knowledge and skills that are useful and important for all educated persons regardless of their profession as well as preparation for advanced courses leading to a specific profession. The second category, professional courses, provides students with direct preparation for a career. The first two years of college usually focus on general education and the second two on the professional studies.

The FES program allows students to obtain the professional skills that employers look for in new employees and a deeper understanding of the scientific basis of those skills. These skills are developed through a combination of core courses focusing on biology, ecology, ecosystems, and management. The forest ecosystem science degree offers a wide variety of employment opportunities. Graduates work throughout the United States in public agencies, private industry, and for nonprofit organizations. They also are well prepared to enter graduate programs in management of forest and natural resources, ecological research, or other areas of applied forest biology.

Forest ecosystem science offers a wide variety of employment opportunities. Graduates work throughout the United States in public agencies, private industry, and for nonprofit organizations. They also are well prepared to enter graduate programs in management of natural resources, ecological research, or other areas of applied forest biology.

The educational program, leading to the professional Bachelor of Science degree in Forest Ecosystem Science, is accredited by the Society of American Foresters (SAF) under Forestry.

Lower Division Required Courses

APM 105

APM 391

EFB 101

EFB 102

EFB 103

EFB 104

ESF 200

EWP 190

EWP 290

FCH 150

FCH 151

FCH 152

FCH 153

FOR 132

FOR 207

FOR 232

FOR 332

FOR 360

PHY 101

Upper Division Required Courses

EFB 336

ESF 300

FOR 304

FOR 313

FOR 322

FOR 323

FOR 334

FOR 345

FOR 465

FOR 492

FOR 493

Elective Courses

Course	Codes*	Credits
Directed Electives: Biophysical Science	PE	12
Directed Electives: Management and Human Dimensions	PE	9
Free Electives		14
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Students should consult with their advisors and read the Sustainable Resources Management Handbook for lists of courses that can be elected to meet degree requirements.

Total Minimum Credits For Degree: 124

BACHELOR OF SCIENCE IN FOREST RESOURCES MANAGEMENT

Professional forestry education has been featured at ESF since the College's founding in 1911. Today's Forest Resources Management program is the top (#1) Forestry Program in the United States according to [Study.com](https://www.study.com). The program is based on a clear vision that combines professional competency with a strong foundation in the biophysical sciences, humanities, and social sciences to meet society's needs for forest managers.

Many ESF students enjoy trees and forests and want to work in forested settings. They appreciate nature, and want to master the knowledge and skills needed to conserve and manage forests and the environment. With 25,000 acres of college forestlands as teaching and research laboratories, ESF provides many opportunities to meet student needs for experiential learning. The Forest Technology program at ESF's Wanakena campus prepares students for careers in field forestry and is one option towards the Forest Resources Management program that emphasizes field skills. Internships with forest-based organizations in the private, public and nonprofit sectors amplify these hands-on experiences. Practical experience is combined with learning concepts and problem solving and critical thinking skills in the classroom and laboratory on ESF's Syracuse campus.

[Forest resources management](#) is an integration of forest ecology and biology, forest measurements, forest policy and administration, and courses to predict and evaluate the effects of manipulation.

Timber, water, soils, recreation, wildlife, and a broad array of environmental values and services, such as biodiversity and healthy forest systems, are important results of effective management. This major prepares students to be well-rounded generalists who can practice forestry and succeed as professionals in a variety of allied natural resources management fields.

Forest resources management offers a wide variety of employment opportunities. Our graduates are working throughout the United States as professional foresters and natural resource managers in private industry, public agencies, and for nonprofit organizations. Their duties can range from timber management to recreation planning to environmental education, to name a few.

The educational program, leading to the professional Bachelor of Science degree in Forest Resources Management, is accredited by the Society of American Foresters (SAF) under Forestry.

Lower Division Required Courses

APM 103

OR

APM 104

APM 391

EFB 100

EFB 336

ESF 200

EWP 190

EWP 220

EWP 290

FCH 110

AND

FCH 111

OR

FCH 150

AND

FCH 151

FOR 132

FOR 207

FOR 232

FOR 313

FOR 332

Upper Division Required Courses

ESF 300

FOR 304

FOR 322

FOR 323

FOR 333

FOR 334

FOR 345

FOR 360

FOR 370

FOR 373

FOR 402

FOR 421

FOR 433

FOR 465

FOR 490

Elective Courses

Course	Codes*	Credits
Technical Electives Technical electives must include at least one course in each of the subject areas: human dimensions; water resources; forest health; wildlife management; business finances; and wood products. Students should consult with their advisor and the Sustainable Resources Management Handbook for recommended courses	PE	18
Free Electives		15
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Total Minimum Credits For Degree: 125

BACHELOR OF SCIENCE IN NATURAL RESOURCES MANAGEMENT

The Natural Resources Management (NRM) program is structured to introduce students to a wide range of renewable natural resources (soils, water, vegetation, wildlife, recreation), while maintaining substantial flexibility for student-centered learning in understanding and managing natural systems. It is based on a vision that combines professional competency in management skills with a strong foundation in the social and biophysical sciences.

The program develops professional skills that employers tell us are the most important traits they look for in new employees. These traits are developed through a broad base of classes in the natural sciences, social sciences and humanities, communication, and quantitative and qualitative problem-solving skills. The majority of work scheduled during the first two years (lower division) is in these areas. This major prepares students to be well-rounded natural resources managers.

The educational program, leading to the professional degree in Natural Resources Management, is accredited by the Society of American Foresters (SAF) under Natural Resources and Ecosystem Management.

Lower Division Required Courses

APM 103

OR

APM 104

APM 391

EFB 100

ESF 200

EWP 190

EWP 220

EWP 290

FCH 110

AND

FCH 111

OR

FCH 150

AND

FCH 151

FOR 132

FOR 110

FOR 207

FOR 232

FOR 360

FOR 372

LSA 233

Lower Division Elective Courses

Course	Codes*	Credits
General Education Course in one of the following categories: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3
Sociology or Psychology Course One course from EST 203, SOC 101 or PSY 205.		3

Upper Division Required Courses

ESF 300

FOR 205

FOR 304

FOR 322

FOR 333

FOR 345

FOR 465

FOR 475

FOR 485

FOR 490

Upper Division Required Courses

Course	Codes*	Credits
Free Electives		21
Vegetation Management		3
Technical Writing Directed Elective		3
Water Resources Directed Elective		3
Wildlife or Fisheries Course One course from EFB 390, EFB 413, or EFB 487		3 - 4
Specialized NRM Course: Two upper division courses with a Natural Resources focus, see FNRM Student Handbook		6

Total Minimum Credits For Degree: 122

BACHELOR OF SCIENCE IN SUSTAINABLE ENERGY MANAGEMENT

The Sustainable Energy Management (SEM) degree program introduces students to a wide range of energy markets and resources (e.g., fossil fuels, electricity, renewable and sustainable energy resources), while maintaining substantial flexibility for student-centered learning in understanding and managing energy systems. It combines professional competency in management skills with a strong foundation in the social and biophysical sciences.

The study of energy use and the development of sustainable sources of energy has become a critical national and global issue. Energy issues include concerns about the quality and quantity of the different potential resources, energy security, and the potential impacts on the environment and human health. It is essential that energy professionals understand the production and conversion of different forms of energy, their current and potential future supplies, the markets and policy mechanisms that regulate their supply, and their associated impacts on the environment.

The SEM program exposes students to views from a variety of disciplines as they investigate issues related to current and future energy supply and use. Students explore sustainable uses of energy and resources and develop the professional knowledge and skills needed to conserve and manage energy resources.

The SEM program develops the professional skills that private industry, public agency, and nonprofit organization employers look for in employees. These traits are acquired through foundational courses in the natural sciences, social sciences and humanities, communication, and quantitative and qualitative problem-solving, and critical thinking skills. The program requires a base of coursework in math and science, and additional work in applied economics, statistics, and applied energy courses. It has a strong focus on developing management skills needed to work in the energy field so that alumni are well-rounded managers in the energy field. The program also provides the skills and knowledge needed to be successful in future graduate degree work.

ESF provides a variety of opportunities to meet students' needs through on-campus sustainable energy demonstration projects and research. Classroom- and laboratory-learned concepts and skills are expanded upon through experiential ESF-based and off-campus field learning. For example, the Central NY region has significant and diverse (e.g., solar and wind installations, hydropower, and biomass-based facilities) that the program uses for experiential learning opportunities.

SEM students integrate the skills and knowledge accumulated from professional and supporting coursework in their senior year capstone experience. Capstone projects analyze the technical, financial, and environmental aspects of a real-world energy related issue and develop recommendations based on those analyses. The results are presented orally and in a written report to demonstrate their abilities as future energy resource managers.

Importantly, the SEM major was designed with enough flexibility so that students can focus on specific interests and, if desired, supplement their employment credentials with one or more ESF minors (e.g., Sustainable Construction, Economics, Management). Many students also study abroad, and nearly all SEM students have paid internships between their junior and senior years.

Lower Division Required Courses

APM 103

OR

APM 104

OR

APM 105

APM 391

EFB 100

ESF 200

EWP 190

EWP 220

EWP 290

FCH 110

AND

FCH 111

OR

FCH 150

AND

FCH 151

FOR 132

FOR 110

FOR 207

FOR 360

SRE 150

Lower Division Elective Courses

Course	Codes*	Credits
General Education Courses - Select one from the following four subject areas: US History & Civic Engagement, The Arts, World History and Global Awareness, World Languages	G	3
General Education Course in Diversity, Equity, Inclusion and Social Justice	G	3

Upper Division Required Courses

CME 305

ESF 300

EWP 407

FOR 205

FOR 333

FOR 485

SRE 325

SRE 337

SRE 416

SRE 422

SRE 441

SRE 450

SRE 454

SRE 479

SRE 491

Upper Division Elective Courses

Course	Codes*	Credits
Students should consult with their advisor and the Sustainable Resources Management Handbook for recommended courses		15
Free Electives		21

Total Minimum Credits For Degree: 120

GRADUATE PROGRAMS SUSTAINABLE RESOURCES MANAGEMENT

The SRM graduate program prepares students for careers in resource administration, management, scientific research, professional education, and a variety of other specialized positions related to the sustainable management of natural and built systems and resources.

M.F. M.P.S, M.S. & Ph.D. in Forest Resources Management

Master of Forestry (M.F.)

The Master of Forestry (MF) graduate degree program enables students to integrate knowledge and expertise drawn from both the natural and social sciences, and to apply their knowledge to solve practical forest management problems.

The primary focus of the program is to provide an opportunity for graduates coming from diverse academic backgrounds with non-forestry baccalaureates to gain a professional education in forestry. As such, the program is designed to be the first professional degree in forestry attained by a student. Graduates will successfully function as professional foresters on multi-disciplinary forest management teams and respond to the challenges related to the sustainable management of local, regional, and global forest resources.

The degree requires 37 graduate credits of coursework, of which at least 24 must be taken in residence at ESF. The degree accredited as a professional forestry program by the Society of American Foresters under Forestry.

The program is open to both students with some prior background in forestry and natural resources, and for those without such background. More than four (4) semesters may be required for students from non-science backgrounds who need additional basic undergraduate coursework as part of their degree program. The MF program is designed for May admission to accommodate the 4-week summer field course at the Ranger School in Wanakena, NY that is taught in June. All MF students must begin the program with this important foundational field course.

Undergraduate Required Core Courses

FOR 304

ESF 300

EFB 336

Graduate Required Core Courses

FOR 522

FOR 524

FOR 532

FOR 533

FOR 545

FOR 570

FOR 573

FOR 689

FOR 690

FOR 898

FOREST RESOURCES
MANAGEMENT DIRECTED
ELECTIVE

3

Master of Professional Studies (M.P.S.)

The Master of Professional Studies (M.P.S.) graduate degree program enables students to integrate knowledge and expertise drawn from both the natural and social sciences, and to apply their knowledge to solve practical forest and natural resources management problems. The primary focus of the program is to provide an opportunity for graduates coming from related academic backgrounds with baccalaureates to gain a professional education in forestry. As such, the program is designed to be the first professional degree in forest and natural resources management. Graduates will successfully function as professional managers on multi-disciplinary forest and natural resources management teams and respond to the challenges related to the sustainable management of local, regional and global resources.

The M.P.S. degree is a coursework-based degree that enables students to increase, refine, and integrate their natural science and social science knowledge and expertise in forest and natural resources management.

The degree requires at least 30 graduate credits of coursework. At least 24 of the course credits must be taken in residence at ESF. Within these credits, students must complete a core of required courses and other requirements.

The program is open to both students with some prior background in forestry and natural resources and for those without such background. Students with a degree in a related discipline (e.g., ecology, biology, wildlife, chemistry, etc.) can complete the M.P.S. degree in twelve (12) to eighteen (18) months. Students without a general science background will require eighteen (18) to twenty-four (24) months to complete the program. The curriculum is designed for fall admission, but spring semester admission is possible. More than four (4) semesters may be required for students from non-science backgrounds who need additional basic undergraduate coursework as part of their program of study.

Required Courses

GRADUATE LEVEL STATISTICS

3

FOR 560

FOR 692

15 CREDIT IN AREA OF STUDY 15

QUANTITATIVE METHODS 3

Master of Science (M.S.)

The Master of Science (M.S.) graduate degree program enables students to integrate knowledge and expertise drawn from both the natural and social sciences, and to research issues and apply their knowledge to solve practical problems in forest and natural resources management situations. The primary focus of the program is to provide an opportunity for graduates coming from related academic backgrounds with baccalaureate degrees to gain a science-based education in forest and natural resources management. Graduates will successfully function as researchers and managers on multi-disciplinary forest management teams and respond to the challenges related to the sustainable management of local, regional and global resources.

The program is open to both students with some prior background in forestry and natural resources and for those without such background. Students with a degree in a related discipline (e.g., ecology, biology, wildlife, chemistry, etc.) can complete the M.S. degree in twenty-four (24) to thirty (30) months. Students without a general science background will require more than thirty (30) months to complete the program. More than four (4) semesters of coursework may be required for students from non-science backgrounds who need additional basic undergraduate coursework as part of their program of study.

The degree requires at least 30 graduate credits, of which 24 are for coursework and six for the thesis. One-half of the 24 hours of coursework must be at the 600-level or above. At least 18 of the coursework credits must be taken in residence at ESF. All students must take two topical seminars.

Doctor of Philosophy (Ph.D.)

The Doctor of Philosophy (Ph.D.) graduate degree program enables students to extend knowledge and expertise from their natural and social science background in their baccalaureate and master's degrees. It is normally built upon a M.S. degree, but in some instances it can be undertaken after a non-research based graduate degree (such as a J.D., M.B.A, M.P.A, or M.P.S. degree).

The primary focus of the program is to provide an opportunity for graduates coming from diverse academic backgrounds to gain a science-based education in forest and natural resources management.

The degree provides students with an opportunity for in-depth study and to conduct a comprehensive scientifically based research program using advanced research tools. Ph.D. dissertations are expected to lead to a number of peer-reviewed articles in influential journals.

The degree is appropriate for students interested in advanced positions as forest and natural resources educators, researchers, managers, consultants and analysts on the local, regional and global levels.

The program is open to both students with some prior background in forestry and natural resources and for those without such background. Students with degrees in a related discipline (e.g., ecology, biology, wildlife, chemistry, etc.) can complete the Ph.D. degree in three (3) to five (5) years. Students with a general science background, but little or no forest or natural resources experience, may require more than five (5) years to complete the program.

The degree requires at least 60 graduate credit hours, of which 48 are for coursework and 12 for the dissertation. One-half of the 48 hours of coursework must be at the 600-level or above. At least 24 coursework credits must be taken in residence at ESF. All students must take two topical seminars.

Areas of Study

Forest Management and Operations (M.F.)

The Forest Management and Operations area of study focuses on the the management of forest ecosystems. Students learn how management decisions affect the sustainability of forests and provides the training necessary to be a professional forester. It is an applied area of study designed to meet professional accreditation standards.

Ecology and Ecosystems (M.P.S., M.S., Ph.D.)

The Ecology and Ecosystems area of study focuses on the structure, function, dynamics, and resilience of terrestrial ecosystems, at a range of scales, from tree genetics and plant physiology to landscape ecology, modeling and remote sensing.

Because functioning and resilient ecosystems are central to human well-being, research opportunities in this area of study address a diversity of topics that help us better understand and enhance the sustainability of terrestrial ecosystems in a rapidly changing world.

Economics, Governance and Human Dimensions (M.P.S., M.S., Ph.D.)

The Economics, Governance and Human Dimensions area of study emphasizes the human dimensions of resource systems involved in the processes of decision-making and action related to how coupled human-natural systems may be managed for sustainable outcomes.

This area of study also incorporates rigorous research into human behavior in recreational and natural settings, a topic that draws from multiple disciplinary perspectives in the social sciences.

Forest Management & Silviculture

The Forest Management and Silviculture area of study focuses on sustainable management of forest ecosystems.

Because functioning and resilient forest ecosystems are essential to human well-being, research opportunities in this area of study address practices and decisions, economic and recreational considerations, landowner objectives and/or policies, ecological underpinnings, and applied science related to the sustainable management of forests.

Monitoring, Analysis and Modeling (M.P.S., M.S., Ph.D.)

The Monitoring, Analysis and Modeling area of study focuses on the application of statistical and operations research methods and techniques used to sample, describe and predict how individual trees, forest stands and terrestrial ecosystems change over both temporal and spatial scales.

Because trees and forests respond in varying ways to an array of human and natural disturbances, research opportunities in this area of study address a diversity of topics that help us to better understand and evaluate the dynamics of terrestrial ecosystems in a rapidly changing world.

M.P.S., M.S., & Ph.D. in Natural Resources Management (CIP code: 3.0199)

The Natural Resources Management program focuses on both the underlying theory and on-the-ground application of practices to achieve sustainable outcomes in natural resource systems.

Because management practices and decisions arise from the combination of ecological knowledge, economic considerations and landowner/manager objectives and/or policies, research opportunities in management are interdisciplinary by nature.

M.P.S, M.S. & Ph.D. in Sustainable Construction Management (CIP code: 14.3301)

Areas of Study

Construction Management (M.S., M.P.S.)

This option is for students who plan to specialize in construction management. Studies depend upon the student's previous education, professional objectives and interests.

Recent graduates have matriculated upon completion of undergraduate degrees in architecture, mechanical engineering, construction management and civil engineering.

M.S. in Construction Management

Applicants for the Construction Management area of study leading to an M.S. degree are required to have a bachelor's degree in one of the following: science, construction management, business, management, architecture or engineering.

Topics for M.S. research may include the following areas in the management of construction projects: Construction project management, Estimating, cost engineering, building codes and zoning, Production management, Computer graphics and computer applications in construction.

For the M.S. degree in Construction Management the following courses are required (or equivalent with committee approval):

Required Courses

CME 543

CME 653

CME 654

M.P.S. in Construction Management

The M.P.S. degree is a non-thesis degree open to students with a demonstrated interest in the profession of construction management. A bachelor's degree in one of the following is strongly recommended: science, construction management, business, management, architecture, engineering, or related field of study.

Coursework

- Required: 12 cr hrs
- Directed Electives: 6-12 cr hrs
- Open Electives: 3-9 cr hrs
- Practicum/Synthesis Project: 3-6 cr hrs
- Total credit hours: 30 cr hrs

Required Courses (12 credits)

CME 543

CME 653

CME 654

CME 658

Directed Elective Courses (6 - 12 credits)

CME 525

CME 531

CME 535

CME 658

Open Elective Courses (3 - 9 credits)

FOR 665

FOR 670

FOR 680

FOR 687

FOR 770

EST 550

EST 603

EST 604

EST 605

EST 626

EST 627

EST 635

EST 640

EST 660

Professional Experience/Synthesis Project (3-6 credits)
CME 898

Sustainable Construction (M.S., M.P.S.)

This option is for students interested in sustainable construction practices including topics such as energy use in buildings, material use in sustainable construction, life cycle analysis, environmental rating systems and environmental performance measures.

Students with a strong background in science are given greater consideration.

M.S. in Sustainable Construction

Applicants for the Sustainable Construction area of study leading to an M.S. degree are required to have a bachelor's degree in one of the following: science, construction management, architecture or engineering. It is preferred that students have a science background and to have completed courses in physics, chemistry and calculus.

Topics for the M.S. or Ph.D. research may include the following: Energy systems in buildings, Sustainable materials, Environmental performance measures, Building codes, Renewable materials, Deconstruction and reuse, Life cycle analysis, building performance.

For the M.S. degree in Sustainable Construction, students must complete coursework in construction project management if this was not part of their undergraduate degree.

M.P.S. in Sustainable Construction

The M.P.S. degree is open to students with a demonstrated interest in sustainable construction such as properties of construction materials, energy systems in buildings, rating systems and building performance. A bachelor's degree in one of the following is strongly recommended: science, construction management, architecture, engineering, or related degree. It is preferred that students have a science background and to have completed courses in physics, chemistry and calculus.

Coursework

- Required: 12 cr hrs
- Directed Electives: 6-12 cr hrs
- Open Electives: 3-9 cr hrs
- Practicum/Synthesis Project: 3-6 cr hrs

- Total credit hours: 30 cr hrs

Core courses (12 credits)

CEE 678

CME 504

CME 505

CME 532

CME 565

CME 605

Construction management courses (6-12 credits)

CME 543

CME 653

CME 654

Application electives (3-9 credits)

EST 550

EST 603

EST 604

EST 605

EST 626

EST 627

EST 635

EST 640

EST 660

FOR 665

FOR 670

FOR 680

FOR 687

FOR 689

FOR 770

Professional Experience/Synthesis (3-6 credits):
CME 898

M.P.S., M.S., & Ph.D. in Sustainable Energy

The Sustainable Energy (SE) graduate program enables students to focus on energy resource management and policy research with a strong foundation in the social and biophysical sciences.

The study of responsible energy resources use and the development of sustainable sources of energy have become critical national and global issues. Energy concerns include the quality and quantity of energy resources, energy security, and the impacts of energy generation, transmission and use on the environment and human health. The SE program prepares graduates to lead in addressing these concerns through the development of professional competency in transdisciplinary research and analytical skills. SE graduates advance into careers in academia, sustainable energy administration and management, scientific research, consulting, environmental advocacy, and a variety of other specialized positions related to sustainable energy resources.

SE students take courses in energy systems and pathways, resource management, environmental engineering, law and policy, and statistical analysis, among others. Rather than follow a specific track, the curriculum path for each student will follow a mentor-based approach tailored to individual professional and research interests. Students work with their major professor and steering committee to develop their coursework curriculum, which includes opportunities for both classroom-based and lab- and field-based instruction.

- M.P.S. students are required to complete 30 credit hours of graduate coursework.
- M.S. students are required to take 30 graduate credit hours, including 24 hours of coursework credit and six thesis research credits; 12 coursework credit hours must be at the 600-level or above.
- Ph.D. students are required to take 60 graduate credit hours, including 48 hours of coursework credit and 12 hours of thesis research credit.

Certificate in Climate Sustainability Leadership

The Advanced Certificate in Climate & Sustainability Leadership is a science-based leadership and management-oriented certificate for emerging professionals who work on greenhouse gas emissions reduction, climate adaptation, and sustainability projects.

This program is a 10-credit advanced certificate that provides content training in climate change science, current climate protection, policies, analytic tools and critical thinking, project management, problem solving, workplace effectiveness, communication, and fundraising.

Students in this advanced certificate program will also participate in the Strategic Energy Innovations' (SEI) [Climate Corps Fellowship program](#). Climate Corps fellows gain real-world expertise in the climate change field, while working with private, public and nonprofit partners in the community to address real world climate and sustainability projects and cultivate the next generation of environmental leaders. The SEI Climate Corp Fellowship program develops

relationships with partners to identify placements for fellows and raises funds from partners that provides fellows with stipend and tuition support for the academic program they participate in at SUNY ESF.

Required Courses

SRE 650

SRE 660

SRE 898

CERTIFICATE IN CLIMATE & SUSTAINABILITY LEADERSHIP

The Advanced Certificate in Climate & Sustainability Leadership is a science based leadership and management-oriented certificate for emerging professionals who work on greenhouse gas emissions reduction, climate adaptation, and sustainability projects.

This program is a 10-credit advanced certificate that provides content training in climate change science, current climate protection, policies, analytic tools and critical thinking, project management, problem solving, workplace effectiveness, communication, and fundraising.

Students in this advanced certificate program will also participate in the Strategic Energy Innovations' (SEI) [Climate Corp Fellowship program](#). Climate Corps fellows gain real-world expertise in the climate change field, while working with private, public and nonprofit partners in the community to address real world climate and sustainability projects and cultivate the next generation of environmental leaders. The SEI Climate Corp Fellowship program develops relationships with partners to identify placements for fellows and raises funds from partners that provides fellows with stipend and tuition support for the academic program they participate in at SUNY ESF.

Required Courses

SRE 650

SRE 660

SRE 898

THE RANGER SCHOOL

Mariann Johnston, Director

Wanakena Campus
315-848-2566
315-848-3249 (fax)

The SUNY ESF Ranger School in Wanakena, N.Y., offers students a unique educational experience in a spectacular natural setting.

The Ranger School confers the associate in applied science degree (A.A.S.) in three areas of study: forest technology, land surveying technology, and environmental and natural resources conservation. The Ranger School's one-plus-one plan allows students to complete their first year at the college of their choice, then spend their second year at The Ranger School. While many move directly into outdoor careers in the areas of conservation, forestry and surveying, some use their A.A.S. as a hands-on, experience-based step toward a bachelor of science degree, earned at ESF's main campus in Syracuse, N.Y.

Academic Programs

Associate of Applied Science (A.A.S.) Degree

The Ranger School offers Associate of Applied Science (A.A.S.) degrees in three areas. The A.A.S. is typically earned with two years of study.

There are several advantages of combining a Ranger School associate's degree with a four-year B.S. degree at the ESF Syracuse Campus. Ranger School graduates who go on to pursue the bachelor's degree have a solid field education and are well positioned to benefit from the deeper ecological and social understanding provided by the professional curriculum.

Students wishing to transfer from the Ranger School to the B.S. programs at the Syracuse campus will be admitted as juniors. Students entering programs in the Sustainable Resources Management Department will be given credit for the summer session in field forestry. Students entering Environmental Biology programs may petition for credit in Ecological Monitoring and Biological Diversity assessment. They will still have to complete some physical sciences, social sciences and humanities requirements while in residence at Syracuse, depending on prior preparation.

NOTE: Students contemplating subsequent transfer should concentrate their freshman year electives in the social sciences and humanities.

NOTE: It is recommended that students complete the first semester in chemistry, one semester in physics and a course in calculus prior to transferring. It is possible to be admitted without these courses, but subsequent progress in the program becomes more difficult.

ENVIRONMENTAL AND NATURAL RESOURCES CONSERVATION (A.A.S.)

The environmental and natural resources conservation program provides students with the scientific theory and applied skills necessary for a technical career in the environmental and natural resources sector. This program will provide students with a solid grounding in applied ecological and sociopolitical concepts, accompanied by technical training in plant and tree identification, land surveying, natural resources measurements, geospatial applications, soil and water monitoring, wildlife techniques and forest recreation.

Students interested in a baccalaureate degree may wish to investigate programs in the Environmental Biology, Environmental Studies or the Sustainable Resources Management departments. Transfer is possible upon completion of the A.A.S. degree at Wanakena. Students should consult with an advisor in the Undergraduate Admissions office as soon as possible.

The freshman year environmental and natural resources conservation curriculum consists of general studies courses which may be taken at any accredited four-year, community, or technical college.

First Year Required Courses

Course	Codes*	Credits
General Biology with lab	G	4
Science Course with lab (Biology, Chemistry, or Physics)		4
English with a Focus on Writing (Two 3-credit courses)	G	6
Trigonometry or pre-calculus (1 course)	G	3
Diversity, Equity, Inclusion & Social Justice	G	3
Total Maximum Transfer Credits		20

Second Year Required Courses
FTC 200

FTC 202

FTC 204

FTC 206

FTC 207

FTC 208

FTC 210

FTC 211

FTC 212

FTC 219

FTC 221

FTC 234

FTC 236

FTC 237

FTC 238

FTC 239

FTC 240

Total Minimum Credits for Degree: 64

FOREST TECHNOLOGY (A.A.S.)

A degree in [Forest Technology](#) provides students with knowledge of the field practice of forest management, the ability to work and communicate effectively with professional and paraprofessional personnel, and an understanding of the physical, biological and quantitative aspects that form the basis of forestry. The educational program in forest technology, leading to the associate of applied science degree in forest technology, is accredited by the Society of American Foresters (SAF).

Students wishing to pursue a baccalaureate degree may wish to investigate programs in the Sustainable Resources Management Department, in particular the Forest Resource Management and Natural Resource Management degree options provide viable transfer pathways for Ranger School students. Students should consult with an advisor in the Undergraduate Admissions office as soon as possible.

The first year forest technology curriculum consists of general studies courses which may be taken at any accredited four-year, community, or technical college.

First Year Required Courses

Course	Codes*	Credits
General Biology with lab	G	4
Science Course with lab (Biology, Chemistry, or Physics)		4
English with a Focus on Writing (Two 3-credit courses)	G	6
Trigonometry or pre-calculus (1 course)	G	3
Diversity, Equity, Inclusion & Social Justice	G	3
Total Maximum Transfer Credits		20

Second Year Required Courses

FTC 200

FTC 202

FTC 204

FTC 206

FTC 207

FTC 208

FTC 209

FTC 211

FTC 213

FTC 214

FTC 217

FTC 219

FTC 221

FTC 225

FTC 234

FTC 238

FTC 239

Total Minimum Credits For Degree: 64

LAND SURVEYING TECHNOLOGY (A.A.S.)

Land surveying technology students obtain a sound technical background in fundamental land surveying principles, techniques and skills. They become well-rounded technical specialists capable of teamwork, communication and problem solving, and they develop life-long learning skills and abilities.

The program provides students with a combination of surveying and land resource knowledge and related skills which are not available elsewhere. Students will be thoroughly exposed to the field of land surveying through a carefully planned combination of classroom lectures, demonstrations and hands-on experience. The educational program in land surveying technology, leading to the associate of applied science degree in land surveying technology, is accredited by the ETAC Accreditation Commission of ABET, <https://www.abet.org/>.

Students wishing to pursue a baccalaureate degree may wish to investigate programs in the Sustainable Resources Management Department such as Construction Management. The Ranger School does have an articulation agreement with SUNY Alfred State for students wishing to pursue a baccalaureate in the land surveying field.

The first year land surveying technology curriculum consists of general studies courses which may be taken at any accredited four-year, community, or technical college.

First Year Required Courses

Course	Codes*	Credits
General Biology with lab	G	4
Physics	G	4
English with a Focus on Writing (Two 3-credit courses)	G	6
Trigonometry or pre-calculus (1 course)	G	3
Diversity, Equity, Inclusion & Social Justice	G	3
Total Maximum Transfer Credits		20

Second Year Required Courses
FTC 200

FTC 202

FTC 204

FTC 205

FTC 206

FTC 207

FTC 208

FTC 214

FTC 225

FTC 239

FTC 251

FTC 253

FTC 255

FTC 256

FTC 257

FTC 259

Total Minimum Credits For Degree: 64

* **Special Course Codes** (Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.) **G** = General Education Course (GenEd), **E** = Engineering, **ES** = Engineering Sciences, **M** = Mathematic, **NS** = Natural Sciences, **PE** = Professional Education, **S** = Summer-only

A-Z COURSE LIST

ESF FACULTY AND PROFESSIONAL STAFF

Nasri Abdel-Aziz (2001) Director, Math Program and Instructor, Environmental Studies, MS, Syracuse University, 2001

Neal M Abrams (2007) Associate Professor, Associate Chair Chemistry, Chemistry, PHD, Pennsylvania State University-Main Campus, 2005

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