

# 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	Survey Of Calc & Appl I	4
APM 391	Intro/Probability&Stats	3
EFB 101	Gen Bio I:Organismal Bio&Ecol	3
EFB 102	General Biology I Laboratory	1
EFB 103	Gen Bio II:Cell Bio & Genetics	3
EFB 104	General Biology II Laboratory	1
EFB 120	The Global Envirnmnt & Society	3
EFB 132	Orientation Seminar:EFB	1
EFB 202	Ecol Monitor&Bio Assessmnt	3
EFB 210	Diversity of Life I	3
EFB 211	Diversity of Life II	3
EFB 307	Principles Of Genetics	3
EFB 308	Prin Of Genetics Lab	1
EFB 311	Principles of Evolution	3
EFB 320	General Ecology	4

EFB 325	Cell Biology	3
EFB 424	Limnology:Study Inland Waters	3
EFB 486	Ichthyology	3
EFB 492	Sr Synthesis/Aquatic&Fish Sci	1
EWP 190	Writing And The Envrnment	3
EWP 290	Research Writing & Humanities	3
FCH 150	General Chemistry I	3
FCH 151	General Chemistry I Lab	1
FCH 152	General Chemistry II	3
FCH 153	General Chemistry II Lab	1
FCH 210	Elements Of Organic Chem	4
FOR 207	Introduction To Economics	3
FOR 110	Environmental Physics	3
PHY 102	Major Concepts of Physics II	0 - 8
OR		
FCH 223	Organic Chemistry II	3
AND		
FCH 224	Organic Chemistry Lab II	1
OR		
APM 106	Survey Of Calc & Appl II	4

## 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).

### 1. 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.

### 2. 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

### 3. 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:

#### a. 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**

#### b. 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

#### **4. 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

#### **5. 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

#### **6. 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

#### **7. 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

#### **8. 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**