Aquatic Biology, B.S. *major*
Fisheries Biology Emphasis

Special Note: Students seeking fisheries certification through the American Fisheries Society are encouraged to carefully select their Liberal Education courses to include 9 credits from courses related to composition, technical writing and/or verbal communications.

A total of 120 semester credits are needed for the **Aquatic Biology, Fisheries Biology emphasis B.S.** degree and include the following:

- Completion of a minimum of 40 upper division credits (level 3000/4000)
- Completion of all required major credits
- Completion of Core Curriculum credits (Minnesota Transfer Curriculum [MnTC] Goal Areas 1-10 with a minimum of 40 credits) required for all baccalaureate degrees
- Completion of BSU Focus and Nisidotaading Course Requirements

Dual Degrees
Students wishing to complete two degrees concurrently, (example: Bachelor of Science and Bachelor of Arts) must complete a minimum of an additional 30 credits above the required 120 credits.

Multiple Credentials
Any additional major, minor or certificate in a degree must have at least 6 credits of course work not used to meet the requirements of another major, minor or certificate in the degree.

Required Credits: 73
Required GPA: 2.50

I REQUIRED BIOLOGY COURSES

Complete the following courses:

- BIOL 1400 Cellular Principles (4 credits)
- BIOL 1500 Diversity of Life (4 credits)
- BIOL 2360 Genetics (4 credits)
- BIOL 2610 General Ecology (3 credits)

II REQUIRED AQUATIC BIOLOGY CORE COURSES

Complete the following courses:

- BIOL 3361 Limnology (4 credits)
- BIOL 3362 Streams and Rivers (4 credits)
- BIOL 3830 Aquatic Plants and Algae (4 credits)
- BIOL 4200 Freshwater Invertebrates (4 credits)
- BIOL 4534 Ichthyology (4 credits)
- CHEM 3507 Analytical Chemistry (3 credits)
  or ENVR 4220 Sampling and Analysis (4 credits)
  or GEOL 3211 Environmental Hydrology (3 credits)
  or GEOL 3212 Hydrogeology (3 credits)
- GEOG 3231 Introduction to Geographic Information Systems (3 credits)

III CAPSTONE PROJECT

CAPSTONE PROJECT The Aquatic Biology capstone project, completed in the senior year, provides a culminating experience that integrates the knowledge and skills learned in previous courses and applies them to a scholarly activity. Examples of capstone projects may include original research projects or internships with state and federal agencies. The capstone project must be designed or chosen by the student in consultation with a faculty mentor or advisor, who must approve the project before work begins. Students should consult with their faculty mentor or advisor before their senior year commences. All capstone projects will include a written and oral component. Specific capstone requirements vary by field of emphasis. Refer to requirements as listed in specific emphases.

Complete the following courses:

- BIOL 4898 Fisheries Research I (2 credits)
- BIOL 4899 Fisheries Research II (2 credits)

FISHERIES BIOLOGY EMPHASIS

Required Core Courses
Comlete the following course:

- BIOL 4545 Fisheries Management (4 credits)

Elective Core Courses
Select a minimum of 6 credits from the following:

- BIOL 2339 Ethics of Fish and Wildlife Management (3 credits)
- BIOL 3400 Fish & Wildlife Law and Administration (3 credits)
- BIOL 3420 Human Dimensions of Wildlife and Fisheries Management (3 credits)
- ENVR 3040 Environmental Economics (3 credits)
  or ECON 3040 Environmental Economics (3 credits)
- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)

V REQUIRED COURSES IN RELATED FIELDS

Complete the following courses:

- CHEM 1111 General Chemistry I (4 credits)
  or CHEM 2211 Principles of Chemistry I (4 credits)
- CHEM 1112 General Chemistry II (4 credits)
  or CHEM 2212 Principles of Chemistry II (4 credits)

Select 2 of the following courses:

- ENVR 3800 Sustainability Analytics & Modeling (3 credits)
- GEOG 4265 Spatial Analysis (3 credits)
- MATH 2471 Calculus I (5 credits)
- PSY 3401 Basic Statistics for Research (4 credits)
- PSY 4403 Advanced Statistics and Research Design (4 credits)
- STAT 2610 Applied Statistics (4 credits)
- STAT 3610 Time Series Analysis (3 credits)

Select 1 of the following courses:

- PHYS 1101 General Physics I (4 credits)
- PHYS 2101 Physics I (4 credits)

Program Learning Outcomes | Aquatic Biology, B.S.

1. Communicate: Effectively present research using common, professional formats (written and/or verbal). This includes using figures, graphs, tables, and illustrations to promote dissemination and clarity of knowledge.

2. Create Purpose or Hypothesis: Provide justification for the importance of pursuing a project or construct a testable hypothesis (or hypotheses).

3. Observe and Question: Integrate information or observations to promote curiosity and question generation.

4. Recognize Larger Implications: Demonstrate understanding of the ethical/

social dimensions or societal implications of science, recognize inherent biases, and communicate scientific ideas to non-science audiences.

5. Re-engage: Demonstrate an ability to re-engage with the research process by identifying sources of error, possible limitations of their research, next steps in a project, or re-designing more appropriate experimental methods/controls.

6. Research: Plan and execute research, experiments, data collection, analysis of the results, and/or synthesis of new or coalesced knowledge.

7. Review Research Literature: Search and review appropriate sources with a goal of independent information discovery or critically identifying knowledge gaps.

Suggested Semester Schedule | Aquatic Biology, B.S., Fisheries Biology Emphasis

Freshman

- BIOL 1400 Cellular Principles (4 credits)
- BIOL 1500 Diversity of Life (4 credits)
- CHEM 1111 General Chemistry I (4 credits)
  or CHEM 2211 Principles of Chemistry I (4 credits)
- CHEM 1112 General Chemistry II (4 credits)
  or CHEM 2212 Principles of Chemistry II (4 credits)
- Core Curriculum Requirements

Sophomore

- BIOL 2360 Genetics (4 credits)
- BIOL 2610 General Ecology (3 credits)
- PHYS 1101 General Physics I (4 credits)
  or PHYS 2101 Physics I (4 credits)
- Core Curriculum Requirements
- Math/Statistics Requirements

Junior

- BIOL 3361 Limnology (4 credits)
- BIOL 3362 Streams and Rivers (4 credits)
- BIOL 3830 Aquatic Plants and Algae (4 credits)
- BIOL 4200 Freshwater Invertebrates (4 credits)
- CHEM 3507 Analytical Chemistry (3 credits)
  or ENVR 4220 Sampling and Analysis (4 credits)
  or GEOL 3211 Environmental Hydrology (3 credits)
  or GEOL 3212 Hydrogeology (3 credits)
- Elective courses in field of emphasis
- Complete Core Curriculum Requirements
- Math/Statistics Requirements

Senior

- BIOL 4534 Ichthyology (4 credits)
- BIOL 4545 Fisheries Management (4 credits)
- BIOL 4898 Fisheries Research I (2 credits)
- BIOL 4899 Fisheries Research II (2 credits)
- GEOG 3231 Introduction to Geographic Information Systems (3 credits)
- Elective courses in field of emphasis

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