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

A total of 120 semester credits are needed for the **Aquatic Biology, Aquatic Systems 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: 74
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. CHOOSE ONE OF THE FOLLOWING THREE OPTIONS:

COMPLETE THE FOLLOWING COURSE:

- BIOL 4894 Advanced Research Project I (2 credits)

COMPLETE THE FOLLOWING COURSE:

- BIOL 4895 Advanced Research Project II (2 credits)

COMPLETE THE FOLLOWING COURSES:

- BIOL 4894 Advanced Research Project I (2 credits)
- BIOL 4895 Advanced Research Project II (2 credits)

AQUATIC SYSTEMS EMPHASIS

REQUIRED CORE COURSES
COMPLETE THE FOLLOWING COURSE:

- BIOL 3850 Marine Biology (3 credits)

ELECTIVE CORE COURSES
SELECT A MINIMUM OF 9 CREDITS FROM THE FOLLOWING:

- BIOL 3310 Entomology (3 credits)
- BIOL 3420 Human Dimensions of Wildlife and Fisheries Management (3 credits)
- BIOL 3610 Principles of Wildlife Management (3 credits)
- BIOL 3630 Conservation Biology (3 credits)
  or GEOG 3630 Conservation Biology (3 credits)
- BIOL 3723 Ecosystem Ecology (3 credits)
- BIOL 4620 Evolution (3 credits)
- GEOG 3232 Intermediate Geographic Information Systems (3 credits)

ADDITIONAL ELECTIVES
SELECT AN ADDITIONAL 3-4 CREDITS OF BIOLOGY ELECTIVES AT THE 3000 LEVEL OR ABOVE.

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)
- STAT 2610 Applied Statistics (4 credits)
  or PSY 3401 Basic Statistics for Research (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- PHYS 1101 General Physics I (4 credits)
- PHYS 2101 University 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., Aquatic Systems Emphsais

The following is a list of required Aquatic Biology Major, B.S., Aquatic Systems Emphasis courses arranged by year. This schedule is intended to assist students in planning their courses. There is some flexibility in this schedule, but graduation within four years will require close adherence to the specified sequence of courses. Always consult your academic advisor in Aquatic Biology as to the proper courses and sequence of courses needed for graduation. Note: With proper student planning and in consultation with the Aquatic Biology academic advisor a student may complete his or her academic degree in 120 semester credits. It is possible, in some circumstances, that courses in a student's Core Curriculum program may be used in his or her academic major.

Freshman

- BIOL1400
- BIOL1500
- CHEM1111
  or CHEM2211
- CHEM1112
  or CHEM2212
- Core Curriculum Requirements

Sophomore

- BIOL2360
- BIOL2610
- PHYS1101
  or PHYS2101
- STAT2610
  or PSY3401
- Core Curriculum Requirements

Junior

- BIOL3361
- BIOL3362
- BIOL3830
- CHEM3507
  or ENVR4220
  or GEOL3211
  or GEOL3212
- Elective courses in field of emphasis
- Complete Core Curriculum Requirements

Senior

- BIOL4200
- BIOL4534
- GEOG3231
- Capstone Project
- Elective courses in field of emphasis