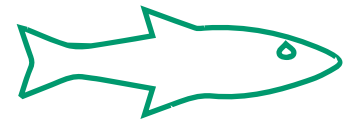


FISH ECOLOGY AND MANAGEMENT (B.S.)



The B.S. in Fish Ecology and Management is designed for students interested in the research and management of fish populations, other freshwater and marine organisms, and the ecosystems that sustain them.

All of the following courses (29 credits):

- FW 101 Fundamentals of Fisheries and Wildlife Ecology and Management (3 cr.)
- FW 101L Fundamentals of Fisheries and Wildlife Ecology and Management Lab (2 cr.)
- FW 102 Fundamentals of Fisheries and Wildlife - New Student Seminar (1 cr.)
- FW 293 Undergraduate Seminar in Fisheries and Wildlife (1 cr.)
- FW 334 Human Dimensions of Fisheries and Wildlife Management (3 cr.)
- FW 364 Ecological Problem Solving (3 cr.)
- FW 471 Ichthyology (4 cr.)
- FW 474 Field and Laboratory Techniques for Aquatic Studies (3 cr.)
- FW 479 Fish Population Analysis and Management (3 cr.)
- FW 497 Capstone: Conservation and Management Decision Making (W) (3 cr.)
- IBIO 355 Ecology (3 cr.)

One of the following groups (6 or 9 cr):

- BS 161 Cell and Molecular Biology (3 cr.) **and** BS 162 Organismal and Population Biology (3 cr.)
- LB 144 Biology I: Organismal Biology (4 cr.) **and** LB 145 Biology II: Cellular and Molecular Biology (5 cr.)

One from each group (5 cr):

- CEM 141 General Chemistry (4 cr.) **or** LB 171 Principles of Chemistry (4 cr.)
- CEM 161 Chemistry Lab (1 cr.) **or** LB 171L Principles of Chemistry Lab I (1 cr.)

***One of the following courses (2 cr):**

- BS 171 Cell and Molecular Biology Lab (2 cr.)
- BS 172 Organismal and Population Biology Lab (2 cr.)

*This requirement is waived if student completes LB 144 or LB 145

One of the following courses (3 or 4 cr):

- MTH 124 Survey of Calculus I (3 cr.)
- MTH 132 Calculus I (3 cr.)
- LB 118 Calculus I (4 cr.)

One of the following courses (3 or 4 cr):

- STT 201 Statistical Methods (4 cr.)
- STT 224 Introduction to Probability and Statistics for Ecologists (3 cr.)
- STT 231 Statistics for Scientists (3 cr.)
- STT 421 Statistics I (3 cr.)

One of the following courses (3 or 4 cr):

- CSUS 310 History of Environmental Thought and Sustainability (3 cr.)
- FW 439 Conservation Ethics (3 cr.)
- HST 391 Environmental History of North America (3 cr.)
- PHL 214 Indigenous Philosophy (3 cr.)
- PHL 340 Ethics (3 cr.)
- PHL 342 Environmental Ethics (3 cr.)
- PHL 380 Nature of Science (3 cr.)
- PHL 442 Ethics and Animals (3 cr.)
- PHL 480 Philosophy of Science (4 cr.)

At least 7 credits from the following courses (continued on next page):

- CEM 142 General and Inorganic Chemistry (3 cr.)
- CEM 162 Chemistry Laboratory II 1
- CEM 143 Survey of Organic Chemistry (4 cr.)



At least 7 credits from the following courses (continued from previous page):

- CSS 210 Fundamentals of Soil Science (3 cr.)
- *FOR 419 Applications of GIS to Natural Resources Management (4 cr.)
- GEO 203 Intro to Meteorology (3 cr.)
- GEO 206 Physical Geography (3 cr.)
- GEO 208 Physical Geography of the National Parks (2 cr.)
- GEO 221 Intro to Geographic Information (3 cr.)
- GEO 221L Intro to Geographic Information Lab (1 cr.)
- GEO 333 Geography of Michigan and the Great Lakes Region (3 cr.)
- GEO 411 Stream Systems and Landforms (3 cr.)
- GLG 201 The Dynamic Earth (4 cr.)
- GLG 411 Hydrogeology (3 cr.)
- LB 172 Principles of Chemistry II (3 cr.)
- LB 172L Principles of Chemistry II - Reactivity Laboratory I (1 cr.)
- LB 271 Organic Chemistry (3 cr.)
- LB 273 Physics I (4 cr.)
- PHY 221 Studio Physics for Life Scientists I (4 cr.)
- PHY 231 Introductory Physics I (3 cr.)
- PHY 251 Introductory Physics Laboratory I (1 cr.)

*Students who select FOR 419 may not also use GEO 221 and 221L.

Two of the following courses (6 or 7 cr):

- COM 100 Human Communication (3 cr.)
- COM 225 Intro to Interpersonal Communication (3 cr.)
- COM 240 Intro to Organizational Communication (4 cr.)
- COM 275 Effects of Mass Communication (3 cr.)
- CSUS 433 Grant Writing and Fund Development (3 cr.)
- JRN 472 Environmental, Science and Health Reporting (3 cr.)
- WRA 331 Writing in the Public Interest (W) (3 cr.)
- WRA 333 Writing in Corporate Contexts (3 cr.)
- WRA 335 Writing in Scientific Contexts (3 cr.)
- WRA 337 Writing and Public Policy (3 cr.)
- WRA 453 Grant and Proposal Writing (3 cr.)

Two of the following courses (6 or 7 cr):

- CSUS 354 Water Resources Management (3 cr.)
- FW 416 Marine Ecology & Management (3 cr.)
- FW 417 and 417L Wetland Ecology & Management with Lab (4 cr.)
- FW 420 Stream Ecology (3 cr.)
- FW 472 Limnology (3 cr.)
- GLG 303 Oceanography (3 cr.)

One of the following courses (3 cr):

- CSUS 464 Environmental and Natural Resource Policy in Michigan (3 cr.)
- CSUS 465 Environ. and Natural Law (3 cr.)
- FOR 466 Natural Resource Policy (3 cr.)
- FW 445 Biodiversity Conservation Policy and Practice (3 cr.)
- FW 481 Global Issues in Fisheries and Wildlife (3 cr.)
- IBIO 446 Environmental Issues in Public Policy (3 cr.)
- MC 450 International Environmental Law and Policy (3 cr.)

One of the following courses (3 or 4 cr):

- PLB 218 Plants of Michigan (3 cr.)
- PLB 418 Plant Systematics (3 cr.)
- ENT 404 Fundamentals of Entomology (4 cr.)
- ENT 422 Aquatic Entomology (3 cr.)
- IBIO 306 Invertebrate Biology (4 cr.)

One of the following courses (3 or 4 cr):

- FW 423 Principles of Fish and Wildlife Disease (3 cr.)
- FW 431 Ecophysiology and Toxicology of Fishes (3 cr.)
- FW 463 Wildlife Disease Ecology (3 cr.)
- IBIO 313 Animal Behavior (3 cr.)
- IBIO 328 Comparative Anatomy and Biology of Vertebrates (4 cr.)
- IBIO 341 Fundamental Genetics (4 cr.)
- IBIO 483 Environmental Physiology (3 cr.)

One of the following courses (3 cr):

- FOR 360 Forest Ecosystems, Carbon and Climate Change (3 cr.)
- GEO 409 Global Climate Change & Variability (3 cr.)
- IBIO 357 Global Change Biology (W) (3 cr.)
- SOC 478 Climate Change & Society (3 cr.)

Complete a minimum of 3 credits from the following courses:

- FW 480 International Studies in Fisheries and Wildlife (1 to 3 cr.)
- FW 490 Independent Study in Fisheries and Wildlife (1 to 3 cr.)
- FW 493 Professional Internship in Fisheries and Wildlife (1 to 3 cr.)
- FW 494 Marine Biology and Ecosystem Experience (1 to 3 cr.)
- FW 499 Senior Thesis in Fisheries and Wildlife (4 cr.)

