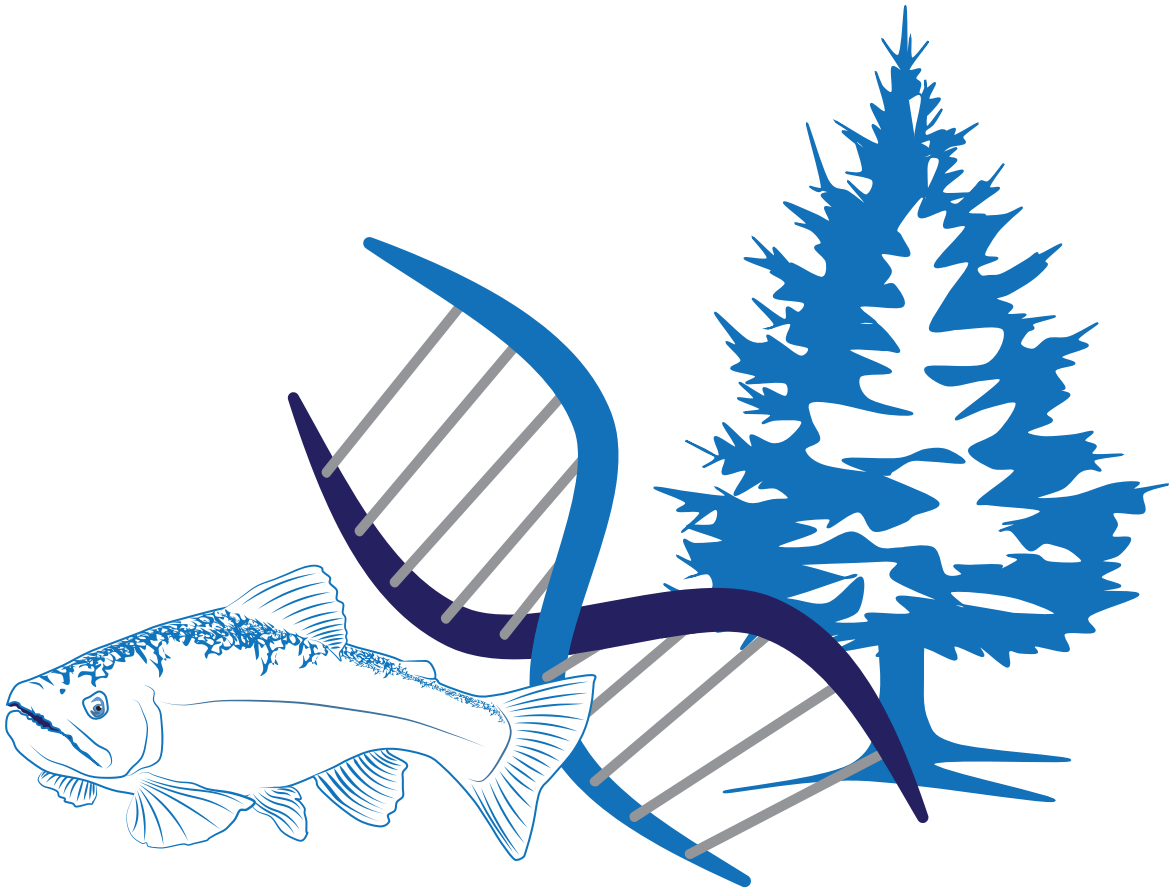
STUDENT HANDBOOK



Department of Biology

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Welcome to the Biology Department! This Handbook is intended to provide you with a brief overview of our Department and Major Program and to provide you with information that will be useful to you as you complete your Biology (B.S.) degree. Consult the most current edition of the University *Bulletin* for more detailed information on University and Departmental policies and requirements. As a Biology Major, you will be assigned an Academic Advisor who will also be a valuable source of assistance and guidance on your path to graduation. We hope that this Handbook serves as a useful guide throughout your time at Westfield State University.

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MISSION STATEMENT

The mission of the Biology Department of Westfield State University is to foster in all students an understanding of and curiosity about the living world and biological processes, an appreciation of how scientific knowledge is acquired, and the ability to apply their knowledge and skills to generate new questions.

We provide our majors with a broad education in all of the fundamental areas of modern biology, while also assisting them in their pursuit of advanced knowledge and skills in one or more sub-disciplines. Our faculty create a high-quality, nurturing learning environment in which students are challenged to expand and critically evaluate their knowledge, critically evaluate information, and communicate effectively. We produce well-educated citizens who are prepared to take advantage of a wide range of career opportunities, and who can become active and valued members of society.

REQUIREMENTS

Students majoring in Biology must complete both the University Common Core requirements and the courses required for the Major. Materials relevant to these requirements are also listed in the APPENDICES. All Biology Majors must take the following courses from within the Department:

- The introductory major's biology sequence (BIOL 128 & 129)
- First year and senior seminars (BIOL 180 & 380)
- One topical seminar (BIOL 280-289)
- Upper-level courses including ONE course from each of the following areas:
  - Evolution
  - Ecology
  - Cell / Molecular
  - Organismal / Physiology
- Nine (9) credits of 300-level courses, at least 6 of which must be the research-intensive BIOL 377 courses. BIOL 399 (Independent Research) may be substituted for ONE section of BIOL 377.

Majors must also complete the following courses:

- General Chemistry I & II (CHEM 109 & 111)*
- Organic Chemistry I & II (CHEM 201 & 203)
- Two of the following: Calculus I (MATH 105), Biostatistics (BIOL 278)*, or Elementary Statistics (MATH 108)*

* These courses also count toward satisfaction of the University Common Core requirements.

Students seeking initial licensure in biology education (Grades 8-12) have specific requirements within the major. If you are interested in this option, you should consult with the Biology Education coordinator as early as possible.

ADVISING

Upon declaring biology as your major, you will be assigned an Academic Advisor by the Department Chair. This advisor will aid you in selecting courses, long-range planning of a course of study, satisfying the requirements of the University and Major, and other academic issues that may arise as you continue your studies. You will need to consult with your advisor at least twice per year in order to enroll in courses for future semesters, but you are encouraged to consult with your advisor whenever you have a question regarding your academic program. When you decide upon an area of concentration within the Major, it may be beneficial to switch to an advisor with expertise in that field, or whom you believe can most successfully guide you toward your academic goals. To change your advisor, consult with your proposed new advisor and then with the Department Chair.

Several forms are included in the APPENDICES of this Handbook to help you and your Academic Advisor plan your long-term course of study and to guide your progress toward completion of all of the University and Departmental graduation requirements.

COURSE SEQUENCE RECOMMENDATIONS

Biology majors are strongly encouraged to take BIOL 128 and BIOL 129 in their first year. These courses are prerequisites for most of the upper-level courses in the Major. Although it may be beneficial to take Biology 128 and 129 sequentially, the courses are designed so that it is possible to take them in either order.

All incoming students are expected to enroll in BIOL 180, a one-credit seminar course. This seminar is designed to introduce students new to our program to the theory and practice of biological inquiry, and to introduce the student portfolio (see ASSESSMENT).

The Department recommends that majors take the two-semester general chemistry sequence (CHEM 109, 111) and the two-semester organic chemistry sequence (CHEM 201, 203) in their third year. If desired, biochemistry (CHEM 313 or 315) may be taken concurrently with CHEM 203, or in the fourth year (completion of biochemistry satisfies the requirements for a minor in chemistry). Additional information on course sequence recommendations is in Appendix 3 of this booklet.

If you are interested in applying to medical school, it may be beneficial to start the chemistry sequence in your first year, since you may be better prepared to take the MCAT exam. You should discuss your interests and career goals with your Academic Advisor so that the appropriate electives and course sequence best prepares you for future opportunities.

UPPER-LEVEL COURSES

Some upper-level courses (particularly 300-level courses) are offered only in alternate years. It is important, therefore, not to wait until the final semester of your University career to take your 300-level courses. Work with your Academic Advisor to be certain that you have *taken all of the courses that are prerequisites* for upper-level courses in which you are interested. You are also permitted to count one semester of Independent Research (BIOL 399) as one of the 300-level courses required for the major.

Course offerings vary from semester to semester and from year to year, particularly at the upper level. A schedule of courses and the semesters in which they are generally offered is listed in Appendix A-2 of this Handbook. You should consult this list and your Academic Advisor as you plan your long-term course of study.

INTERNSHIPS & INDEPENDENT PROJECTS

Internships (1-6 credits, depending upon arrangement) provide a fabulous opportunity to learn skills and gain experience while obtaining exposure to the expectations and demands of your chosen field. The intention of the internship program is to provide the student with "real world" experience and exposure outside the campus while earning course credit. Internships may be paid or unpaid positions that involve joint supervision by a faculty member and a supervisor at the off-campus site. The internship program is particularly recommended for students who intend to pursue a career immediately following graduation. The availability and variety of internship opportunities varies from semester to semester. The Department Chair, your Academic Advisor, or a faculty member with a specialty within your area of interest may be able to help direct you to internship opportunities specific to biology. The Career Services Center (see STUDENT RESOURCES) may also be able to provide information on internship opportunities. Additional opportunities may be found on various web sites.

Independent Study (BIOL 299; 1-3 credits) and Independent Research (BIOL 399; generally 3 credits) programs allow students to pursue independent research or technology projects under the supervision of a faculty member. An independent study or research project is highly recommended for students intending to pursue graduate or professional school. Projects are generally designed by the student, with guidance from the faculty supervisor. If you are interested in performing an independent project, you should approach a faculty member who is experienced in your research area of interest.

DEPARTMENT LEARNING OUTCOMES

Knowledge
Students will demonstrate a comprehension of the following core concepts from the molecular to ecosystem level:

- Evolution: Change over time and mechanisms involved
- Structure and function: How the shape of something affects performance
- Energy transformation: Energy capture, use and transfer
- Information flow: Transmission and interpretation of biological information
- Systems: Interaction and organization of components

Skills
Students will be able to:

- Apply the process of science.
- Apply quantitative reasoning to biological questions.
- Work effectively as a team.
- Properly use laboratory and field equipment and techniques in an accurate, safe manner.

Communication

- Contextualize scientific topics as it relates to society using scientific literature.
- Communicating and listening to those who have differing view points and perspectives in a collegial and respectful manner.
- Communication of ideas effectively both orally and in writing.

PORTFOLIO

All biology majors are required to demonstrate that they have met specific learning outcomes. One of the tools used by the Department to assess the progress of our majors toward the mastery of these objectives is the on-going compilation and evaluation of a student portfolio. This portfolio is introduced in the First Year Seminar (BIOL 180), and will be presented and discussed with a faculty supervisor on a yearly basis as part of the Department seminar series. Successful completion of the seminar series requires the presentation of a complete portfolio in the Senior Seminar (BIOL 380).

- Bring the **Advising Checklist** to your advising meeting every semester. Review the Course Alignment Worksheet with your advisor.

- All students should schedule at least one visit at the Career Center *before* BIOL 380. Documentation of this visit will be recorded on the **Advising Checklist**. In addition, you will turn in a document that you developed with the help of the Career Center or a reflective summary of your Career Center experience.

- Develop a **cover letter and resumé** for a job or for a graduate school that you would pursue following graduation.

- Complete the **Course Alignment Worksheet** (given in BIOL 180 and checked during advising meetings). For each Learning Outcome, describe your level of mastery for each course. This is a working document, so use the electronic copy to type in your notes every semester. This information will be used to write your reflective essays during BIOL 380.

- Attend at least **five (5) biology-related lectures/talks** and integrate what you learned into the reflective essays. For Biology Education students, at least two of the lectures must be biology-education/STEM-education related. Document attendance at the lectures in the Course Alignment Worksheet.

- Write five (5) **reflective essays,** one for each Knowledge Outcome.
    - Synthesize the appropriate Knowledge Outcome and integrate the appropriate Skill and Communication outcomes for each essay.
    - Cite evidence from your coursework, research, internships, and guest lectures for each outcome. Evidence cannot be used more than twice. *Evidence includes (but is not limited to):* lab activities, research, presentations, guest lectures/conference talks. Be sure to describe the evidence with a significant amount of detail (so always save your work every semester!).
    - Articulate the development of your knowledge and connections between courses in your program. Reflect upon how your degree program prepared you for your future career as a biologist.

- Provide **three (3) pieces of evidence** that represent your best work in your biological discipline. Choose evidence that could be showcased during an interview. For each piece of evidence, write a 200-word summary describing why you picked the evidence and how it contributed to your growth as a biologist.

STUDENT RESOURCES

A number of resources are available to all students at Westfield State University free of charge. These resources include the Tutoring Center, Student Support Services, the Reading and Writing Center, the Career Services Center, and resources on the Department's web page. The Tutoring Center provides tutoring and other academic assistance to students, and provides opportunities for advanced students to serve as paid tutors. Student Support Services provides workshops and assistance on study skills, data analysis, writing laboratory reports, and other skills that are valuable to students in general and Biology Majors in particular. The Reading and Writing Center provides assistance in planning, writing, and revising assignments. A wide range of resources are provided by the Career Services Center, including job fairs, listings of internship and employment opportunities, graduate school information, and individual assistance on resume writing, job interview preparation, and related skills.

Information valuable specifically to Biology Majors may be found on the Department's web page (http://biology.westfield.ma.edu). Materials posted on this site include updated versions of this Student Handbook, requirements for the Major in Biology, a listing of all courses offered by the Department (including descriptions and syllabi for some of the courses), and learning objectives that students are expected to meet as part of the requirements for completion of the Major. Also available on the site are schedules and other information about Departmental faculty and staff, a link to the Westfield State University Writer's Guide (which provides useful information on writing papers, assignments, and laboratory reports), laboratory exercises for some of our courses, and data generated by students. It will be useful to you as a student to familiarize yourself with the information and resources available on this web site.

GRADUATE & PROFESSIONAL SCHOOL PREPARATION

If you have an interest in attending a graduate or professional school following graduation from Westfield State University, additional preparation may be necessary. You should discuss your plans with your Academic Advisor. You may also wish to discuss your interests with our pre-med, pre-health, and graduate school advisors. These advisors may suggest specific courses or a specific concentration within the major. In particular, courses in physics and calculus are recommended for students interested in graduate and professional schools. You should also become acquainted with the resources available at the Career Services Center (see STUDENT RESOURCES).

APPENDIX A-1 **ADVISING WORKSHEET**
Department of Biology
Westfield State University

COMMON CORE of Studies	MAJOR COURSES
Humanities Section (18 credits, 6 from each area): English Composition (6 credits) 1) ____ ENGL 0101 2) ____ ENGL 0102 Literary & Phil. Analysis (6 credits) 1) _____ 2) _____ Appreciation of the Arts (6 credits) 1) _____ 2) _____ **Social Science Section (12 credits):** U.S. Hist. & Gov. (at least 3 credits must be from this area) 1) _____ Social Understanding (maximum 9 credits) 1) _____ (PSYC 0101 licensure) 2) _____ (EDUC 0220 licensure) 3) _____ **Mathematics/Applied Analytical Reasoning Section (6 credits):** Pick any two of the following: Calculus, Elementary Statistics, Biostatistics. 1) _____ 2) _____ **Science Section (8 credits):** (BIOL 0102, 0104, & 0106 do not satisfy requirements for Biology) 1) ____ CHEM 0109 General Chemistry I 2) ____ CHEM 0111 General Chemistry II	**Introductory Courses:** ____ BIOL 0128 Intro to Organ, Eco & Evol Bio ____ BIOL 0129 Intro to Mol, Cell & Dev Bio **Seminar Courses (3 credits, 1 credit each):** ____ BIOL 0180 First Year Seminar ____ BIOL 0280 – 0289 BIOL Seminar (BIOL 289 licensure) ____ BIOL 0380 Senior Seminar **Required Chemistry Courses:** ____ CHEM 0109 General Chemistry I (CORE) ____ CHEM 0111 General Chemistry II (CORE) ____ CHEM 0201 Organic Chemistry I ____ CHEM 0203 Organic Chemistry II **Upper Division Biology Courses (15 credits):** **ONE** course from each of the following areas: **1) EVOLUTION** ____ BIOL 0230 Evolution **2) ECOLOGY** ____ BIOL 0201 General Ecology (licensure) **OR** ____ BIOL 0202 Conservation Biology **3) CELL/MOLECULAR** ____ BIOL 0203 Genetics (licensure) **OR** ____ BIOL 0205 Cell Biology (licensure) **OR** ____ BIOL 0223 Microbiology **4) ORGANISMAL/PHYSIOLOGY** ____ BIOL 0211 Plant Biology **OR** (licensure) ____ BIOL 0221 Vertebrate Physiology **OR** ____ BIOL 0227 Comp. Vertebrate Anatomy **OR** ____ BIOL 0237 Human Anatomy & Phys I (licensure)** ____ BIOL 0239 Human Anatomy & Phys II **Elective Courses:** a minimum of 15 credits in BIOL above 100-level selected with guidance from the faculty advisor, including a minimum of TWO 377 COURSES. Three or more credits of BIOL 0399 Independent Research may be substituted for ONE 377-level course. Biochemistry (CHEM 0313) may be included as one of the courses satisfying the 15 credits, but

Diversity Section (6 credits, 3 from each area):

1) _____ Global Diversity

2) _____ U. S. Diversity (EDUC 0380 licensure)

Requirements for Graduation

Students must meet the following requirements to graduate with a baccalaureate degree:

1. A cumulative (institutional) GPA of 2.0 or better.
2. A major GPA of 2.0 or better.
3. 120 earned credits of which 30 credits must be completed at WSU. Earned credits require a grade of "D" or better.
4. Successful completion of the CORE.
5. Successful completion of the MAJOR.

MAY NOT be used as one of the courses at the 300-level. **(OVER) ⇒**

Electives (minimum of 15 credits)

1) _____ (200 or 300-level)

2) _____ (200 or 300-level)

3) _____ (300-level)

4) _____ (BIOL 377)

5) _____ (BIOL 377)

Recommended Courses – Students interested in graduate or professional school are strongly recommended to take calculus and a year of physics. Please check requirements for any potential schools.

Licensure for Teacher of Biology (8-12)

____ EDUC 0220 Schools in American Culture
____ EDUC 0221 Students with Special Needs
____ EDUC 0353 Educational Planning and Evaluation: Secondary Schools
____ PSYC 0203 Adolescent Development
____ EDUC 0363 Sheltered English Immersion
____ EDUC 380 Multicultural Education
____ BIOL 390 Methods for Teaching Biology
____ EDUC 0369 Practicum: Secondary (with Practicum seminar)

Required electives for licensure:
____ BIOL 0201 General Ecology
____ BIOL 0203 Genetics
____ BIOL 0205 Cell BIOL (preferred) **OR** 0223 Microbiology
____ BIOL 0211 Plant Biology
____ BIOL 0230 Evolution
____ BIOL 0237 Hum Anatomy & Physiology I
____ PHSC 0101 Introduction to Physics

Plus – the 300-level requirements.

Eligibility for student teaching: completion of all required course and fieldwork, an overall GPA of 2.8, a 3.0 GPA in the professional sequence, and passing MTEL scores.

A-2. UPPER-LEVEL COURSE OFFERINGS: **BIOLOGY**

The following is a general schedule for 200- and 300-level courses in Biology. The schedule may change from semester to semester, so be sure to consult with your Academic Advisor and the Course Offerings booklet each semester. Courses followed by an asterisk (*) are typically offered in alternating years.

FALL SEMESTER	SPRING SEMESTER
BIOL 201 General Ecology	BIOL 200 Natural History in America
BIOL 202 Conservation Biology	BIOL 201 General Ecology
BIOL 203 Genetics	BIOL 202 Conservation Biology
BIOL 204 GIS Apps for Nat. Sci.	BIOL 208 Marine Biology
BIOL 205 Cell Biology	BIOL 210 Histology
BIOL 207 Developmental Biology	BIOL 211 Plant Biology
BIOL 219 Aquatic Biology	BIOL 223 Microbiology
BIOL 230 Evolution	BIOL 230 Evolution
BIOL 237 Human Anatomy & Physiology I	BIOL 233 Environmental Legislation
BIOL 239 Human Anatomy & Physiology II	BIOL 237 Human Anatomy & Physiology I
BIOL 240 Parasitology	BIOL 239 Human Anatomy & Physiology II
BIOL 289 History & Nature of Sci. Knowl.*	BIOL 278 Biostatistics
BIOL 305 Plant Communities	BIOL 302 Molecular Biol. Techniques
BIOL 341 Forest Ecology	BIOL 303 Medical Microbiology*
BIOL 334 Animal Behavior	BIOL 304 Applied Microbiology*
BIOL 377 Research Experience	BIOL 313 Immunology*
BIOL 390 Teaching Secondary Biology	BIOL 377 Research Experience

OTHER COURSES:

The following courses are offered irregularly. Consult with the course instructor to determine when the course will be offered.

BIOL 212 Mammalogy
BIOL 217 Invertebrate Biology
BIOL 311 The Summer Flora
BIOL 322 Electron Microscopy

- NOTES -