

BIOLOGY (M.S.)

Program Overview & Admission Requirements

The Department of Biology in the College of Science, Engineering and Technology (CSET) offers graduate studies leading toward the Master of Science (M.S.) in Biology. The M.S. in Biology degree is research/coursework-oriented and designed to satisfy academic requirements for those students intending eventually to seek degree(s) beyond the master's level. There are three graduation options:

- Master of Science in Biology (Thesis Research Route);
- the Master of Science in Biology (Research Project Route), and
- the Master of Science in Biology (Coursework Route).

Programs Objectives

1. To provide advanced academic and practical training at the master's degree level,
2. To contribute to the pool of biologists and environmental scientists qualified to undertake doctoral degree programs, and to obtain employment in industry, government and academic institutions, and
3. To offer a program that will enable biology majors to obtain the necessary classroom, laboratory and/or field experiences required for entering areas in and related to biological and environmental sciences directly upon graduation.

Admissions Requirements

In addition to the requirements set forth by JSU's Graduate Studies, all applicants seeking admission to the M.S. in Biology program in the Department of Biology must meet the following minimum admission requirements:

1. Compliance with Immunization Requirements: <https://www.jsums.edu/healthservices/immunization-requirements/>
2. An undergraduate (B.S.) degree in biology or related field.
3. A minimum undergraduate grade point average (GPA) of 3.00 or higher as evidenced by an official transcript from all accredited colleges and universities attended
4. Application for admission to JSU Graduate School.
5. Three letters of recommendation (sent directly to the department), at least 2 from academic professors who can assess the applicant's:
 - a. academic qualifications;
 - b. written and oral communication skills;
 - c. capacity for critical and analytical thinking; and
 - d. overall potential for graduate studies;
 Letters of recommendation form (<http://www.jsums.edu/graduateschool>) (<http://www.jsums.edu/graduateschool/>.)
6. A minimum Test of English as Foreign Language (TOEFL) score of 520; and a Certified Declaration of Financial Support filed with JSU Division of International Studies-(required for international/foreign applicants).
7. A career goal essay (maximum of 800-1200 words).
8. A complete application package submitted before or on the following deadlines: March 1 for fall semester; March 15 for summer; and October 15 for spring semester. (Incomplete and late applications received after the deadlines will not be evaluated.)

Transfer of Credits

Courses for which transfer credits are sought must have been completed with a grade of "B" or better. Approval is required by the Chair of the Department.

Time Limit

No student will be granted an M.S. degree unless all requirements are completed within a period of eight (8) consecutive calendar years from the time of admission to the program.

Residence

Students are required to spend one academic year in resident study on campus. One academic year may include two consecutive regular semesters or one regular semester and one adjacent summer session. To satisfy the continuous residence requirement, the student must complete a minimum of eighteen (18) hours for the required period.

Admission to Candidacy Requirements

When a minimum of 12-15 semester hours has been completed, the student should submit an application for advancement to candidacy. Please note that students cannot be advanced to candidacy until:

1. All admission requirements have been met.
2. Notification of the program option the student is electing, or that is required.
3. All incompletes ("I" grades) have been removed.
4. The Graduate English Competency Examination (GECE) was passed, or in the event of failure, passed ENG 500 ADVANCED LAB WRITING with a grade of B or better. Please refer to the graduate Catalogue page 20 for the GECE exemption requirements.
5. Earned a 3.00 cumulative G. P. A.
6. Filed the Application for Graduate Degree Candidacy with the approval of the Candidacy Committee.

Degree Requirements

A student seeking the M.S. in Biology degree must:

1. Complete a minimum of thirty (30), thirty three (33) or thirty-six (36) semester hours based on graduation option, with a B or higher cumulative G.P.A. Six (6; BIO 599 THESIS RESEARCH) or three (3; BIO 620 INDEPENDENT STUDY) of the required semester hours must be in thesis research or graduation project respectively.
2. Pass the Graduate Area Comprehensive Examination (GACE) in 1 elective and 2 core/required courses.
3. Successfully defend the thesis before the Thesis Committee and public audience.

Master of Science in Biology

Courses available for the M.S. degree in Biology:

1. Provide advanced preparation in biological and marine sciences,
2. Provide preparation for advanced professional degrees elsewhere in zoology, plant science, marine science, environmental biology, environmental health, biomedical science, toxicology, genetics, immunology, physiology, microbiology, biochemistry, anatomy and other associated areas,
3. Support careers in industry, government and academic institutions, and

4. Provide preparation for professional degrees in medicine, dentistry, veterinary medicine, pharmacy and related health fields.

MS in Biology Curriculum

Code	Title	Hours
General Core		
BIO 511	BIOSTATISTICS	3
BIO 589	GRADUATE SEMINAR	1
Focus Core Areas		
<i>I. Molecular and Cellular Biology</i>		
BIO 540	CELL BIOLOGY	3
BIO 515	MOLECULAR BIOLOGY	3
CHEM 531	BIOCHEMISTRY	3
BIO 509	GENERAL GENETICS	3
<i>II. Microbiology and Immunology</i>		
BIO 530 & BIOL 530	ADVANCED MICROBIOLOGY and ADVANCED MICROBIOLOGY LAB	4
BIO 550	IMMUNOLOGY & SEROLOGY	3
BIO 561	MOLECULAR VIROLOGY	3
BIO 610	ENVIRONMENTAL MICROBIOLOGY	3
BIO 532	ADVANCED PARASITOLOGY	3
<i>III. Human Physiology and Nutrition</i>		
BIO 513	HUMAN NUTRITION	3
BIO 570	HUMAN PHYSIOLOGY	3
BIO 575	ENDOCRINOLOGY	3
<i>IV. Environmental and Marine Sciences</i>		
BIO 523 & BIOL 523	ECOLOGY and ECOLOGY LAB	4
BIOL 523	ECOLOGY LAB	1
BIO 513	HUMAN NUTRITION	3
BIO 615	PRINCIPLES OF BIOREMEDIATION	3
BIO 517	MAMMALIAN PHYSIOLOGY	3
Thesis/Project		
BIO 599 or BIO 620	THESIS RESEARCH INDEPENDENT STUDY	3-6

All students are required to meet the following requirements:

1. Degree Candidacy (GNST 500 APPS FOR GRAD DEG CAND MASTERS) after completing 12-15 hours of class work.
2. The Graduate Area comprehensive Exam (GACE; GNST 555 GRAD AREA COMP EXAM (MS LEVEL)), one from the general core and two courses from the core emphasis area.

Graduation Options

Thirty (30), Thirty-three (33), or thirty-six (36), semester hours are required for the Master of Science Degree in Biology depending upon which of the following three options, the student selects with approval of his or her department chairperson and/or advisor.

- **Option 2:** Thirty (30) semester hours of coursework plus three-hour independent project
- **Option 3:** Thirty-six (36) semester hours of coursework
- **Option 1:** Requires a formal written thesis, formal presentation.
- **Option 2:** Requires a written Project report, formal presentation
- **Option 3:** Requires an oral exam.

Based on the graduation option, each student should take the general core (4), select one course (4 hours) from each focus areas as a general biology core (16 hours) for a total of (20 hours).

Depending on the focus area and the graduation option, student will select courses from the core area to complete the total number of hours needed for the graduation option.

Students with the approval of their advisor, department chair and the graduate dean may transfer to any of the three graduation options upon approval.

- **Option I:** Twenty-four (24) semester hours of coursework plus a six - hour thesis research