

MS in Biology Curriculum

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 degrees 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 academic and practical training of high quality 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 and environmental science majors to obtain the necessary classroom, laboratory and/or field experiences required for entering areas in and related to environmental science directly upon graduation.

Admissions Requirements

In addition to the requirements set forth by the Division of Graduate Studies, all applicants seeking admission to the M.S. in Biology and/or M.S. in Environmental Science programs 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. For M.S. in Environmental Science program applicants, at least 16 credit hours of biology courses are required.
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/>)
- 5 A Graduate Record Examination (GRE) composite (verbal plus quantitative) score of 800 is required. For applicants with score below 800, partial credit will be assigned

for score of 390 in quantitative or verbal sections. The GRE score must be sent directly to the department,

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.)

Graduate Degrees & Requirements

Transfer of Credits

Course 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 the campus. One academic year may include two adjacent 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 approximately 12-15 semester hours have been completed, the student should make 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 with a grade of B or better.
5. Earned a 3.00 cumulative G. P. A.
6. Filed the Application for Graduate Degree Candidacy with the approval of the Candidacy Committee in his/her major department.

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) or three (3; Bio-620) 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 or project before the Graduate Committee and public audience.

MS in Biology Curriculum

General core (4 hours)

Course	Name	Sem. Hours
BIO 511	Biostatistics	3
BIO 589	Graduate seminar	1

Biology Core (16 hours)

Focus areas:

Molecular and Cellular Biology

BIO 540	Cell Biology	3
BIOL 540	Cell Biology Lab.	1
BIO 515	Molecular Biology	3
BIOL 515	Molecular Biology Lab.	1
CHEM 531	Biochemistry	3
CHML 531	Biochemistry Lab.	1
BIO 509	Advanced Genetics	3
BIOL 509	Advanced Genetics Lab.	1

Microbiology and Immunology

BIO 530	Advanced Microbiology	3
BIOL 530	Advanced Microbiology Lab.	1
BIO 550	Immunology and Serology	3
BIOL 550	Immunology and Serology Lab.	1
BIO 561	Molecular Virology	3
BIOL 561	Molecular Virology Lab.	1
BIO 610	Environmental Microbiology	3
BIOL 610	Environmental Microbiology Lab.	1

Human Physiology and Nutrition

BIO 513	Advanced Human nutrition	3
BIOL 513	Advanced Human nutrition Lab.	1
BIO 570	Human Physiology	3
BIOL 570	Human Physiology Lab.	1
BIO 575	Endocrinology	3
BIOL 575	Endocrinology Lab.	1
BIO 650	Analysis of Hormone Action	3
BIOL 650	Analysis of Hormone Action Lab.	1

Environmental and Marine Sciences

BIO 523	Ecology	3
BIOL 523	Ecology Lab.	1
CHEM 515	Environmental Chemistry	3
CHML 515	Environmental Chemistry Lab.	1
BIO 513	Invertebrate Zoology	3
BIOL 531	Invertebrate Zoology Lab.	1
BIO 615	Principles of Bioremediation	3
BIOL 615	Principles of Bioremediation Lab.	1
BIO 546	Marine/ Environmental Science	3
BIO 546	Marine/Environmental Science Lab.	1
BIO 514	Environmental Analysis	3
BIOL 514	Environmental Analysis Lab.	1
BIO 617	Introduction to Remote –sensing in Environmental Science	3
BIOL 517	Introduction to Remote –sensing in Environmental Science Lab.	1
BIO 533	Biology of Water Pollution	3
BIOL 533	Biology of Water Pollution Lab.	1

Thesis/ project (3-6hours)

BIO 599	Thesis Research	6
Bio 620	Independent Study/Project	3

General Electives

BIO 587	Independent study	2
ITHM 520-531	Industrial/Technical Hazardous Materials Management courses	3-6
BIO 546	Selected Topics in Marine/Environmental Science	1
BIO 547	Introduction to Oceanography	4
BIO 553	Tropical Marine Ecology	4
BIO 580	Limnology	4
BIO 602	Special Problems in Environmental Science	1-4

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 1 Twenty four (24) semester hours of coursework plus a six –hour thesis research

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.

All students are required to pass/meet the following requirements:

1. Graduate English proficiency Exam (GECE; ENG 599/or ENG 500), or have an exempt status.
2. Degree Candidacy (GNST 500) after completing 12-15 hours of classwork.
3. The Graduate Area comprehensive Exam (GACE; GNST 555), one from the general core and two course from the biology core emphasis area.