Academic Programs Booklet

College of Science

2025

Prepared By: VP For Academic Programs and Graduate Studies Office

College of Science

MASTER OF SCIENCE IN BIOLOGICAL SCIENCES **2**

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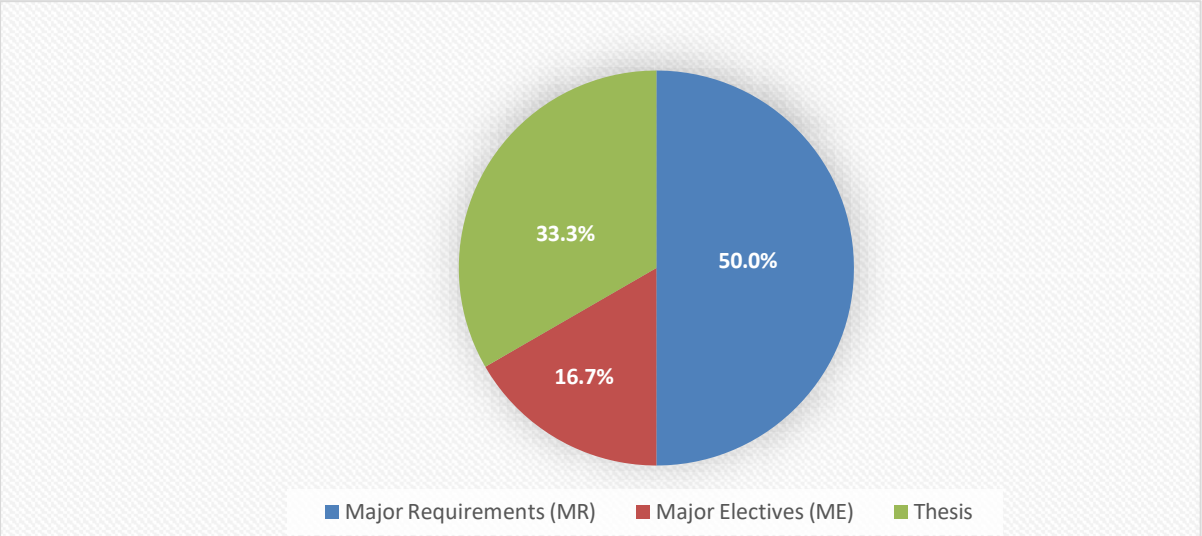
Master of Science in Biological Sciences (2025)

Program Components



Major Requirements (MR)	**18**
Major Electives (ME)[1]	**6**
Thesis	**12**
Total Credit (CRD)	**36**

[1] Student must select **two** elective courses.

Teaching Language: English

Detailed Study Plan

Year 1 - Semester 1

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BIOLS 610	Biostatistics	4	0	4	MR	------	Yes
BIOLS 611	Bioinformatics	4	0	4	MR	------	Yes
BIOLS 612	Advanced Techniques in Biology	4	0	4	MR	------	Yes

Year 1 - Semester 2

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BIOLS 600	Seminar	3	0	3	MR	------	Yes
BIOLS 601	Research Methodology and Ethics	3	0	3	MR	------	Yes
BIOLS 6XX	Elective 1	3	0	3	ME	------	Yes

Year 2 – Semester 3

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BIOLS 6XX	Elective 2	3	0	3	ME	------	Yes

Year 2 – Semester 4

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BIOLS 699	Thesis	0	0	0	Thesis	------	No

Major Elective Courses List

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BIOLS 606	Advances in Biotechnology	3	0	3	ME	-----	Yes
BIOLS 607	Advances in Cell and Molecular Biology	3	0	3	ME	-----	Yes
BIOLS 608	Advances in Marine Biology	3	0	3	ME	-----	Yes
BIOLS 609	Artificial Intelligence in Biology	3	0	3	ME	-----	Yes
BIOLS 613	Special Topics in Biological Sciences	3	0	3	ME	-----	Yes

Course Description

Course Code: BIOLS 600 **Course Title:** Seminar
Selected reading, presentation and discussion of formal scientific colloquium on current various literature and research topics in biology.

Course Code: BIOLS 601 **Course Title**: Research Methodology and Ethics
Proposal preparation; research approaches including descriptive, ecological, cross-sectional, case-control, and cohort studies; tools applied include empirical, questionnaire, survey, and interviews; use of library, analysis and presentation of research data. Students will explore ethical issues in biology in both professional and social realms including authorship, grants accounting, and academic misconduct.

Course Code: BIOLS 606 **Course Title**: Advances in Biotechnology
Examine more sophisticated biotechnology subjects. With emphasis on its applications in industry, agriculture, food, nutrition, health, and medicine, it covers the most recent advancements and methodologies in biotechnology.

Course Code: BIOLS 607 **Course Title**: Advances in Cell and Molecular Biology
It is a course that covers advanced topics in molecular and cell biology including membrane organelles and protein trafficking; cytoskeleton and cell motility; cell cycle regulation; cell signaling mechanisms; and developmental biology.

Course Code: BIOLS 608 **Course Title**: Advances in Marine Biology
An advanced investigation of the diverse organisms in the marine environment and aspects pertaining to the marine ecosystems, including food webs, primary production, interactions, natural products, fouling, commercial application, and anthropogenic impacts.

Course Code: BIOLS 609 **Course Title:** Artificial Intelligence in Biology
This course introduces students to the foundations of artificial intelligence and machine learning for achieving advancements in life sciences. It provides an overview of the basics of artificial intelligence for life science biologists.

Course Code: BIOLS 610 **Course Title:** Biostatistics
Probability theory, Probability distribution, sampling distribution, hypothesis testing, design of experiments, and sampling techniques. Multivariate ANOVA, progression analysis, non-parametric methods, logistic regression, analysis of survival data, coordination, discrimination, and classification. Emphasis on analysis of public health, biological, environmental, and ecological data. Statistical software and packages will be applied.

Course Code: BIOLS 611 **Course Title**: Bioinformatics
This course offers a comprehensive introduction to bioinformatics for biologists, covering sequence analysis, molecular evolution, phylogenetics, genome assembly, and functional genomics. Emphasizing hands-on experience with tools and databases, students gain proficiency in applying bioinformatics techniques across diverse biological domains.

Course Code: BIOLS 612 **Course Title**: Advanced Techniques in Biology
This course offers comprehensive training in advanced laboratory techniques crucial for students embarking on thesis research or seeking proficiency in a diverse range of biological techniques.

Course Code: BIOLS 613 **Course Title**: Special Topics in Biological Sciences
This course will cover special topics for graduate students based on their individual research interest in specialized area. Graduate students will be trained to read, evaluate, and write literature review articles in their specialized topic with an emphasis on recent research.

Course Code: BIOLS 699 **Course Title**: Thesis
Students should select a research topic in any field in Biology. Proposal writing of original scientific research, experimental design, planning, execution, data analysis, hypothesis testing, writing, oral presentation, and defense of a research thesis in biology to internal and external examiner