Curriculum

for the degree of

M.S. in Mathematics

Faculty of Science

Session: 2022-2023

Department of Mathematics

Bangamata Sheikh Fojilatunnesa Mujib Science & Technology University

Jamalpur-2012, Bangladesh.

Contents

Program Name

Master of Science in Mathematics.

Description of the Program

The Department of Mathematics is one of the most active departments within the Faculty of Science. It provides courses that are pertinent to the field in order to generate graduates who are highly trained and have both theoretical and well-equipped practical knowledge. Specifically, it focuses on offering sufficient opportunities to work with relevant instruments, to learn how to design experiments, execute experiments, analyze experiments and troubleshoot problems in the context of solving practical problems. Our students are provided with the background information that is necessary to make educated decisions concerning mathematical and socio-economic challenges in this complicated existence by integrating the themes across the pure and applied mathematics courses, lab experiences and the courses in fields that are not related to science.

Vision

The Mathematics Department at Bangamata Sheikh Fojilatunnesa Mujib Science & Technology University envisions becoming a premier hub for excellence in mathematics education and research. We are committed to cultivating an environment encouraging critical thinking, innovation, and knowledge advancement. Our objective is to equip students to tackle the challenges of a swiftly changing world, contributing to the development of Smart Bangladesh through their mathematical expertise and leadership.

Mission

The Department of Mathematics is determined to fulfill the above vision in the following ways:

1. Offering comprehensive and diverse programs that foster a deep understanding of mathematical principles and applications.
2. Conducting innovative research across multiple mathematical disciplines, contributing to the advancement of pure and applied mathematics, as well as interdisciplinary fields.
3. Providing opportunities for students to engage in theoretical and experiential learning, and research projects to apply mathematical concepts to real-world problems.
4. Fostering a supportive and inclusive learning environment that encourages curiosity, collaboration and critical thinking among students and teachers.
5. Supporting professional development and mentoring programs for students and faculty to enhance teaching effectiveness, research productivity and career opportunities.

Course Structure

1. Program duration: 1.5 year (Thesis Group), 1 Year (General Group)
2. Numbers of Semester: 3 (Thesis Group), 2 (General Group)
3. Semester Duration: 6 Months
4. Earn a minimum CGPA: 2.25
5. Complete the program within 02 (two) academic years of his/her 1st admission year into the program.

Marks and Credits Distribution

Summary of the total available credits

	Thesis Group	General Group
Theory Courses	32 credits	40 credits
Thesis and Presentation	10 credits	-
Viva Voce	4 credits	4 credits
Total	**46 credits**	**44 credits**

Distribution of Marks (as per course types)

Theoretical courses

	Marks (%)
Class Attendance	10%
Internal Evaluation	20%
Semester Final Examination	70%
Total	100%

Continuous Assessment

Continuous assessment includes class attendance, quizzes, class test, tutorial, in-course exam, presentation, assignment or any other form of formative examination.

Thesis work

	Marks (%)
Report Evaluation	60%
Presentation & Viva-voce	40%
Total	100%

Course outline

Course Title and Numbering System

Each course is designated by a two to four letter (for example: MAT 5111) word usually identifying the course offering department followed by a three digits number with the following criteria without any space between letters and numerical.

(a) The first digit will correspond to the year in which the course is normally taken by the students.
(b) The second digit will correspond the semester (1 for January-June and 2 for July-December) in which the course is normally taken by the students.
(c) The third digit will be reserved for departmental use for such things as to identify different areas within a department.

(d) The fourth digit will be '0' for viva-voce, '1 and 4' for theoretical courses, '2' for laboratory/sessional courses and '3' for project /field work/thesis.

Semester-wise course outline for the entire program

1st Semester

Course Code	Course Title	Credits
MAT 5111	Fluid Dynamics	4
MAT 5121	Applied Numerical Methods	4
MAT 5131	Functional Analysis	4
MAT 5141	Rings and Modules	4
MAT 5151	Group Theory	4
MAT 5161	Lattice Theory	4
MAT 5171	Algebraic Topology	4
MAT 5181	Advanced Number Theory	4
MAT 5191	Differential Manifolds	4
MAT 5114	Stochastic Modeling in Finance	4
MAT 5124	Aerodynamics	4
MAT 5134	Theory of Relativity & Cosmology	4
MAT 5144	Astrophysics	4
MAT 5154	Operations Management	4
MAT 5164	Theory of Waves	4
MAT 5154	Commutative Algebra	4
MAT 5160	Viva-voce	2
	Total Credits	22

- Five courses from MAT 5111 to MAT 5164 will be offered for the students of general group as per the decision of the academic committee and out of those five courses, the students of thesis group have to take any four courses with the approval of the departmental academic committee.

2nd Semester

Course Code	Course Title	Credits
MAT 5211	Mathematical Biology	4
MAT 5221	Dynamical Meteorology	4
MAT 5231	Advanced Topology	4
MAT 5241	Fuzzy Mathematics	4
MAT 5251	Field Theory	4
MAT 5261	Advanced Topology	4
MAT 5271	Homological Algebra	4
MAT 5281	Lie Groups and Lie Algebra	4
MAT 5291	Dynamical Systems	4
MAT 5214	Computational Topology	4
MAT 5224	Computational Fluid Dynamics	4
MAT 5234	Mathematical Hydrology	4
MAT 5244	Magnetohydrodynamics & Turbulences	4
MAT 5254	Advanced Quantum Mechanics	4
MAT 5264	Dynamical Oceanography	4
MAT 5254	Nonlinear Oscillation	
MAT 5260	Viva-voce	2
	Total Credits	22

- Five courses from MAT 5211 to MAT 5164 will be offered for the students of general group as per the decision of the academic committee and out of those five courses, the students of thesis group have to take any four courses with the approval of the departmental academic committee.

3rd Semester (only for thesis group)

Course Code	Course Title	Credits
MAT 5313	Thesis	10
	Total Credits	10

Courses for 1st Semester

Sl. No.	Course Code	Course Title	Credits
1	MAT 5111	Fluid Dynamics	4
2	MAT 5121	Applied Numerical Methods	4
3	MAT 5131	Functional Analysis	4
4	MAT 5141	Rings and Modules	4
5	MAT 5151	Group Theory	4
6	MAT 5160	Viva-voce	2
		Total Credits:	22

Courses for 2nd Semester

Sl. No.	Course Code	Course Title	Credits
1	MAT 5211	Mathematical Biology	4
2	MAT 5221	Dynamical Meteorology	4
3	MAT 5231	Advanced Topology	4
4	MAT 5241	Fuzzy Mathematics	4
5	MAT 5251	Field Theory	4
6	MAT 5260	Viva-voce	2
		Total Credits:	22

Courses for 3rd Semester

Sl. No.	Course Code	Course Title	Credits
1	MAT 5313	Thesis	10
		Total Credits:	10