

Rayat Shikshan Sanstha's
KARMAVEER BHURAO PATIL COLLEGE, VASHI.
NAVI MUMBAI
(Autonomous)
Department of Mathematics
B. Sc. Mathematics

Program Outcomes (POs)

Learners are able to–

PO-1	Disciplinary Knowledge	Understand the basic concepts, fundamental principles, theoretical formulations and experimental findings and the scientific theories related to Physics, Chemistry, Mathematics, Microbiology, Computer Science, Biotechnology, Information Technology and its other fields related to the program.
PO-2	Communication Skills	Develop various communication skills such as reading, listening and speaking skills to express ideas and views clearly and effectively.
PO-3	Critical Thinking	Propose novel ideas in explaining the scientific data, facts and figures related to science and technology.
PO-4	Analytical Reasoning and Problem Solving	Hypothesize, analyze, formulate and interpret the data systematically and solve theoretical and numerical problems in the diverse areas of science and technology.
PO-5	Sense of Inquiry	Curiously ask relevant questions for better understanding of fundamental concepts and principles, scientific theories and applications related to the study.
PO-6	Use of Modern Tools	Operate modern tools, equipments, instruments and laboratory techniques to perform the experiments and write the programs in different languages (software).
PO-7	Research Skills	Understand to design, collect, analyze, interpret and evaluate information/data that is relevant to science and technology.
PO-8	Application of Knowledge	Develop scientific outlook and apply the knowledge with respect to subject.
PO-9	Ethical Awareness	Imbibe ethical, moral and social values and exercise it in day to day life.
PO-10	Teamwork	Work collectively and participate to take initiative for various field-based situations related to science, technology and society at large.
PO-11	Environment and Sustainability	Create social awareness about environment and develop sustainability for betterment of future.
PO-12	Lifelong Learning	Ability of self-driven to explore, learn and gain knowledge and new skills to improve the quality of life and sense of self-worth by paying attention to the ideas and goals throughout the life.

PSO-1	Recalling the concepts of mathematics and applying them to the various courses like algebra, analysis, Differential equations, statistics, etc to form mathematical models.
PSO-2	To apply knowledge of Mathematics for pursuing higher studies at reputed national and international institutes including higher research.
PSO-3	Apply Mathematics to interdisciplinary ways like statistician, mathematical finance, industry expertise and interpret quantitative ideas.

SEMISTER-I

UGMT101 Calculus-I

Course Outcomes: After successful completion of this course, students will be able to:

CO-1: State the properties of real numbers.

CO-2: Apply properties of real numbers to prove some inequalities.

CO-3: Define a sequence and classify different types of sequence.

CO-4: State and apply properties of convergence and divergence to sequences and series

ICT Tools Used: Videos, PPT, Pen-Tablet

Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <https://nptel.ac.in/courses/111/106/111106146/>

2) <https://nptel.ac.in/courses/111/104/111104144/>

The CO-PO Mapping Matrix

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	-	-	-	-	-	-	-
CO2	2	2	-	2	-	-	-	-	-	-	-	-
CO3	2	1	2	1	-	-	-	-	-	-	-	-
CO4	2	2	-	2	-	-	-	-	-	-	-	-

*In CO-PO Mapping Matrix: a correlation is established between COs and POs in the scale of 1 to 3, 1 being the slight (low), 2 being moderate (medium), 3 being substantial (high) and '-' indicate there is no correlation in respective CO and PO.

UGMT102 Algebra-I

Course Outcomes: After successful completion of this course, students will be able to:

CO1: Define logic statements.

CO2: Identify and apply various properties relating to the integers.

CO3: Apply different methods of proof to verify mathematical assertions.

CO4: Apply Fundamental theorem of algebra for finding roots of given polynomial.

ICT Tools Used: Videos, PPT, Pen-Tablet

Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <https://nptel.ac.in/courses/111/105/111105112/>

2) <https://nptel.ac.in/courses/111/106/111106113/>

The CO-PO Mapping Matrix

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	-	-	-	-	-	-	-	-
CO2	3	1	1	1	1	-	-	-	-	-	-	-

CO3	2	1	2	1	1	-	-	-	-	-	-	-
CO4	2	2	1	2	-	-	-	-	-	-	-	-

SEMESTER II

UGMT201 Calculus-II

Course Outcomes: After successful completion of this course, students will be able to:

CO1: Define limit, continuity and differentiability of real valued function

CO2: State and prove algebra of limits, continuous functions and differentiability.

CO3: Construct discontinuous function to continuous function

CO4: Apply continuous function State and prove algebra of limits, continuous functions and differentiability.

CO5: Apply differentiation to graph of function functions, L-Hospital Rule, higher derivative and Taylors Expansion.

ICT Tools Used: Videos, PPT, Chalk Board

Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <https://nptel.ac.in/courses/111/104/111104144/>

2) <https://nptel.ac.in/courses/111/104/111104085/>

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	-	-	-
CO2	2	2	3	-	-	-	-	-	-	-	-	-
CO3	2	1	1	2	-	-	-	-	-	-	-	-
CO4	-	2	-	-	-	-	-	1	-	-	-	-
CO5	2	2	-	3	-	-	-	2	-	-	-	-

UGMT201 Algebra-II

Course Outcomes: After successful completion of this course, students will be able to:

CO1: Solve systems of linear equations and interpret their results.

CO2: Compute and interpret determinants of matrices.

CO3: Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra.

CO4: Analyze and construct mathematical arguments that relate to the study of introductory group theory. (Proof and Reasoning).

ICT Tools Used: Videos, PPT, Chalk Board

Students Centric Methods: Problem Solving and Participative (Experimental, Participative, Problem Solving)

Links: SWAYAM / MOOCS:

1) <https://nptel.ac.in/courses/111/105/111105112/>

2) <https://nptel.ac.in/courses/111/106/111106113/>

The CO-PO Mapping Matrix

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	-	-	-	-	-	-	-	-
CO2	2	1	2	2	-	-	-	-	-	-	-	-
CO3	2	2	2	1	-	2	-	-	-	-	-	-
CO4	2	1	1	3	2	1	-	-	-	-	-	-

Scheme of Examination

For UGMT101, UGMT102, UGMT201 and UGMT202 (Semester I & II)

A. There will be a **Semester end examination** of 60 marks.

1. Duration: The examinations shall be of 2:30 Hours duration.

2. Theory Question Paper Pattern:

- a) There shall be FOUR questions. The questions first three questions shall be of 15 marks each based on the units I, II, III respectively. The fourth question shall be of 15 marks based on the entire syllabus.
- b) All the questions shall be compulsory. The questions shall have internal choices within. Including the choices, the marks for each question shall be 30.
- c) The questions may be subdivided into sub-questions and the allocation of marks depends on the weightage of the topic.

B. There will be a **Continuous Internal Assessment (CIE)** of 40 marks.

Paper	20 Marks	10 Marks	10 Marks
Paper I (Calculus)	Unit Test	Assignment/Seminar	Class Test on Unit II
Paper II (Algebra)	Unit Test	Assignment/Seminar	Class Test on Unit II

Question paper pattern for Unit Test of 20 marks:

The unit test for 20 marks will be conducted online. There shall be 20 compulsory multiple choice questions with single correct answer, each carrying one mark.

C. Practical Examination

1. There will be semester end practical examination of 100 marks.

2. Duration: The examinations shall be of **3 Hours** duration.

Practical Exam	Viva	Journal	Total
80	10	10	100

Question paper pattern for practical exam of 80 marks:

Part A: Based on Paper I (Total 40 marks)

Section I: Multiple Choice Questions (Total 16 marks, 2 marks each)

Attempt any **8** out of **12**

Section II: Attempt any **THREE** out of **FIVE** (Total 24 marks, 8 marks each)

Part B: Based on Paper II (Total 40 marks)

Section I: Multiple Choice Questions (Total 16 marks, 2 marks each)

Attempt any **8** out of **12**.

Section II: Attempt any **THREE** out of **FIVE** (Total 24 marks, 8 marks each)

Each Practical of every course of Semester-I and II shall contain 10 problems out of which minimum 05 have to be written in the journal. A student must have a certified journal before appearing for the practical examination.