Name of the Programme: B.A./B.Sc. MATHEMATICS (FYUGP)

PROGRAMME OUTCOMES (PO)

After completing the Four Year Undergraduate Programme in Mathematics, Students are expected to achieve the following Programme Outcomes:

PO1: Disciplinary Knowledge:
Demonstrating comprehensive knowledge of mathematics, interdisciplinary areas, and recent innovations in a multidisciplinary context, connecting relevant disciplines with learning disciplines of choice.

PO2: Communication Skills:
The individual possesses the ability to effectively communicate mathematical concepts through computational, graphical, and geometrical methods, as well as critical reading and critical analysis of texts.

PO3: Moral and Ethical Awareness/Reasoning:
The individual must be able to identify ethical issues in their work, avoid unethical behaviour like plagiarism, and maintain honesty and integrity in their research.

PO4: Multicultural Competence:
The individual possesses the ability to analyze and compare mathematical developments globally, collaborate with diverse researchers, and effectively participate in multicultural groups, acquiring knowledge of diverse values and beliefs.

PO5: Information/Digital Literacy:
Ability to access, asses and utilize Information and Communications Technology (ICT) tools. Ability to understand, read and write programming language/packages/modules (MATLAB; C) for computation, simulation, graphs and solutions.

PO6: Reflective Thinking:

Understanding how researchers shape information, formulating questions, proposing solutions, and interpreting findings are essential skills in mathematics, enabling problem-solving in various fields and real-life applications.

PO7: Cooperation/Team Work:

Ability to collaborate with diverse teams in an effective and respectful manner; capacity to cooperate with people from varied backgrounds in the interests of a common goal.

PO8: Research Related Skills

The ability to analyze and interpret mathematical ideas, formulate questions, and design research proposals, while also developing methodology and demonstrating results**.**

PO9: Problem Solving

The individual possesses the ability to work independently, study mathematics in various industries, and apply their knowledge to real-life situations, demonstrating innovative, imaginative, lateral thinking, and emotional intelligence.

PO10: Critical Thinking

The ability to analyze and synthesize theoretical and applied problems, acquire knowledge through logical reasoning, evaluate arguments, identify gaps, and cultivate a lifelong learning attitude.

Programme Specific Outcomes (PSO)

The programme-specific outcomes of the Undergraduate Programme in Mathematics are listed below. After completing the programme the students will be able to-

PSO1: Apply Mathematics as a tool to solve problems of other disciplines viz., Science and Technology, Commerce and Management, Humanities, Soft-computing etc.

PSO2: Pursue higher studies in the subject to take part in the academic upliftment of the subject and society as a whole.

PSO3: Develop new techniques/methods for solving the unsolved problems of the other disciplines.

PSO4: Construct Mathematical models to mimic real-life problems and make their predictions, estimations, and regression.

Course Outcomes (CO)

B.Sc. 1st Semester

Course Title: Calculus and Classical Algebra
Course Code: MTHC1
Nature of Course: MAJOR
Total Credits: 04 (L=3, T=1, P=0)

On completion of this Course, a student will be able to –
CO1: Apply Calculus in real life problems
CO2: Formulate mathematical models
CO3: Identify the algebraic aspects present in different branches of sciences

Course Title: Differential Calculus
Course Code: MINMTH1
Nature of Course: MINOR
Total Credits: 04 (L=3, T=1, P=0)

At the end of this course the student should be able to:
CO1: Differentiate functions
CO2: Find tangent, normal, curvature, asymptotes etc., of a given curve
CO3: Address the criteria of changing functions

Course Title: Computer Laboratory-I
Course Code: SEC115
Nature of Course: SKILL ENCHANCEMENT COURSE
Total Credits: 03 (L=0, T=0, P=6)

At the end of this course the student should be able to:
CO1: The basic knowledge about MATLAB or Mathematica through command window or creating programing files.

B.Sc. 2nd Semester

Course Title: Real Analysis & Differential Equation
Course Code: MTHC2
Nature of Course: MAJOR
Total Credits: 04 (L=3, T=1, P=0)

At the end of this course the student should be able to:
CO1: Identify the properties of the number system.
CO2: Describe various analytical properties of the real number system
CO3: Use the techniques to solve differential equations.
CO4: Apply these techniques in various mathematical models used in real life problems.

Course Title: Real Analysis
Course Code: MINMTH2
Nature of Course: MINOR
Total Credits: 04 (L=3, T=1, P=0)

At the end of this course the student should be able to:
CO1: Analyse the properties of the number line
CO2: Describe various analytical properties of the real number system

Course Title: Computer Laboratory-II
Course Code: SEC2014
Nature of Course: SKILL ENHANCEMENT COURSE
Total Credits: 03 (L=0, T=0, P=6)

At the end of this course the student should be able to:
CO1: Use MATLAB or Mathematica software through command window or creating programing files for various mathematical modelling problem.

B.Sc. 3rd Semester

Course Title: Theory of Real Functions
Course Code: MTHC3
Nature of Course: MAJOR
Total Credits: 04 (L=3, T=1, P=0)

At the end of this course the student should be able to:
CO1: Discuss limit, continuity and differentiability of real valued functions
CO2: Expand functions in series and different form of remainders

Course Title: Group Theory I
Course Code: MTHC4
Nature of Course: MAJOR
Total Credits: 04 (L=3, T=1, P=0)

At the end of this course the student should be able to:
CO1: Describe various group structures onsets.
CO2: Identify the group structures present in different branches of sciences.

Course Title: Differential Equations
Course Code: MINMTH3
Nature of Course: MINOR
Total Credits: 04 (L=3, T=1, P=0)

At the end of this course, the student should be able to:
CO1: Describe various methods for solving differential equations.

Course Title: Mathematical Logic
Course Code: SEC315
Nature of Course: SKILL ENHANCEMENT COURSE
Total Credits: 03 (L=2, T=1, P=0)

At the end of this course, the student should be able to:
CO1: Analyse the truth and falsity of a logical statement
CO2: Differentiate between a logical statement and an ordinary statement
CO3: Define and describe various properties of sets.

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