Darrang College (Autonomous), Tezpur-784001

Syllabus for FYUGP

Subject: Mathematics

Course Type: SEC

2025-2026

Approved by:

Board of Studies meeting held on 24-12-2025

&

Academic Council vide Resolution no. 2, dated- 29-12-2025

DARRANG COLLEGE (AUTONOMOUS)

TEZPUR ASSAM

FOUR YEAR UNDERGRADUATE PROGRAMME

SYLLABUS

DEPARTMENT OF MATHEMATICS

(As per NEP-2020)

FOUR YEAR UNDERGRADUATE PROGRAMME IN MATHEMATICS

SEMESTER-I
SEC(Skill Enhancement Course)

Title of the course	**MS Power Point and LaTeX**
Course code	MAT- SE-01013
Nature of Course	Skill Enhancement Course
Total Credit	03 (Theory: 02+ Practical: 01)
Contact Hours	60 (Theory 30+ Practical 30)
Total Marks	75 (End Term: 30, Internal Assessment: 20, Practical: 25)

Course Objectives: The purpose of this course is to acquaint students with the latest type setting skills, which shall enable them to prepare high quality typesetting, beamer presentation.

Learning Outcomes: After studying this course, the student will be able to:

- Create beamer presentations.
- Create Effective Presentations: Start a new presentation and apply appropriate slide layouts, Organize content using titles, bullet points, and sections.
- Format Slides Professionally: Apply and customize design themes, fonts, and colors, Use slide master to ensure consistency across slides.
- Create and typeset a LaTeX document
- Typeset a mathematical document using LaTeX
- Learn about pictures and graphics in LaTeX

Unit	Content	L	T	P	Total Hrs
I	**MS Power Point:** Setting Up PowerPoint Environment, Typing the text, Alignment of text, Formatting Text: Font Size, Font Style, Font Color, Use the Bold, Italic, and Underline, Cut, Copy, Paste, Select All, Gear text, Find & Replace, Saving, Printing, Export, Working with Tabs and Indents, Creating slides and applying themes, Inserting new slide, Duplicating slides, Changing layout of slides, Copying and pasting slide, Applying themes to the slide layout. **[2]** **(20 Marks)**	12	03	--	15
II	**LaTeX:** Elements of LaTeX; Hands-on-training of LaTeX, Graphics in LaTeX; PS Tricks, Beamer presentation. **[1]** Chapter: 9 (Sections:1,2), Chapter:10 (Section:3), Chapter:11 **(25 Marks)**	12	03	--	15

III	**Practical:** Based on Unit I and II.	--	--	15	30

Text Book:

1. Satish Jain, M Geetha and Kratika, (2015). *Microsoft Office 2010 Training Guide*, BPB Publications.
2. Martin J. Erickson and Donald Bindner, (2011*). A Student's Guide to the Study, Practice, and Tools of Modern Mathematics*, CRC Press, Boca Raton, FL.

Reference Book:

1. L. Lamport, (1994). L*ATEX: A Document Preparation System, User's Guide and Reference Manual*, Addison- Wesley, New York, Second edition.

FOUR YEAR UNDERGRADUATE PROGRAMME IN MATHEMATICS
SEMESTER-II
SEC(Skill Enhancement Course)

Title of the course	Programming in C
Course code	MAT- SE-02013
Nature of Course	Skill Enhancement Course
Total Credit	03 (Theory: 02+ Practical: 01)
Contact Hours	60 (Theory 30+ Practical 30)
Total Marks	75 (End Term: 30, Internal Assessment: 20, Practical: 25)

Course Objectives: This course introduces C programming in the idiom and context of mathematics and imparts a starting orientation using available mathematical libraries, and their applications.

Learning Outcomes: After completion of this paper, student will be able to:

- Understand and apply the programming concepts of C which is important to mathematical investigation and problem solving.
- Learn about structured data-types in C and learn about applications in factorization of an integer and understanding Cartesian geometry and Pythagorean triples.
- Use of containers and templates in various applications in algebra.
- Use mathematical libraries for computational objectives.
- Represent the outputs of programs visually in terms of well formatted text and plots.
- In practical students learn about the roots of a quadratic equation, solution of an equation using N-R algorithm.

UNIT	CONTENT	L	T	P	Total Hrs
I	Variables, constants, variable declaration, initialization, basic data types, operators and expression (arithmetic, relational, logical, assignment, conditional increment and decrement), hierarchy of operations for arithmetic operators, size of and comma operator, mixed mode operation and automatic (Implicit) conversion, cast (explicit) conversion, library functions.	04	01	--	05

II	Structure of a C program, input/output functions and statements, control statements: if-else statement (including nested if-else statement), switch statement, Loop control Structures (for and nested for, while and do-while). Break, continue, go to statements, exit function.	08	02	--	10
III	Arrays and subscripted variables: One dimensional array declaration, accessing values in an array, initializing. values in an array, sorting of numbers in an array, addition and multiplication of matrices with the help of array.	13	02	--	15
IV	***Practical Based on Unit I, II, III, for example:** to find ▪ Roots of a quadratic equation, ▪ Value of a piecewise defined function (single variable) ▪ Factorial of a given positive integer ▪ Fibonacci numbers ▪ square root of a number, cube root of a number ▪ sum of different algebraic and trigonometric series ▪ a given number to be prime or not ▪ sum of the digits of any given positive integer ▪ solution of an equation using N-R algorithm ▪ reversing digits of an integer ▪ Sorting of numbers in an array ▪ to find addition, subtraction and multiplication of matrices **[1]** Chapters 3, 4, 5, 6, 7 and 9	--	--	15	30

Text books:

1. T. Jeyapoovan, A First Course in Programming with C T. Jeyapoovan, Vikash Publishing House Pvt. Ltd.

Reference books:

1. E. Balaguruswamy, Programming with C. Schaum Series.
2. Y. Kanetkar, Let us C, B.P. Publication.

FOUR YEAR UNDERGRADUATE PROGRAMME IN MATHEMATICS

SEMESTER-III

SEC(Skill Enhancement Course)

Title of the course	**Computer Algebra Systems and Related Software**
Course code	MAT- SE-03013
Nature of Course	Skill Enhancement Course
Total Credit	03 (Theory: 02+ Practical: 01)
Contact Hours	60 (Theory 30+ Practical 30)
Total Marks	75 (End Term: 30, Internal Assessment: 20, Practical: 25)

Course Objectives: This course aims at familiarizing students with the usage of mathematical software (Mathematica/MATLAB/Maxima/Maple) and the statistical software R. The basic emphasis is on plotting and working with matrices using CAS. Data entry and summary commands will be studied in R. Graphical representation of data shall also be explored.

Learning Outcomes: This course will enable the students to:

- Use of software; Mathematica/MATLAB/Maxima/Maple, etc. as a calculator, for plotting functions and animations.
- Use of CAS for various applications of matrices such as solving system of equations and finding eigenvalues and eigen vectors.
- Understand the use of the statistical software R as calculator and learn to read and get data into R.
- Apply R in summary calculation, pictorial representation of data and exploring relationship between data.
- Analyze, test, and interpret technical arguments on the basis of geometry

Unit	Content	L	T	P	Total Hrs
I	**Introduction to CAS and Applications:** Computer Algebra System (CAS), Use of a CAS as a calculator, Computing and plotting functions in 2D, plotting functions of two variables using Plot 3 D and Contour Plot, plotting para metric curves surfaces, customizing plots, animating plots, producing tables of values, working with piecewise defined functions, Combining graphics. [1] Chapter 12 (Sections 12.1 to 12.5) [2] Chapter1, and Chapter 3 (Sections 3.1to 3.6, and 3.8) Chapter 6(Sections 6.2 and 6.3)	12	03	--	15

II	**Working with Matrices:**Simple programming in a CAS, working with matrices, addition, subtraction, multiplication of matrices, Minors and cofactors, working with 3x3 matrices, Solving system of linear equations of three variables. [2] Chapter7(Sections7.1to7.8)	12	03	--	15
	Practical: Six practicals should be done by each student. The teacher can assign practical from the exercises from [1,2].	--	--	15	15

Text Book:

1. Bindner, Donald & Erickson, Martin. (2011). A Student's Guide to the Study, Practice, and Tools of Modern Mathematics. CRC Press, Taylor & Francis Group, LLC.
2. Torrence, Bruce F., & Torrence, Eve A. (2009). The Student's Introduction to Mathematica: A Handbook for Precalculus, Calculus and Linear Algebra (2nd ed.). Cambridge University Press