SCHOOL OF ENGINEERING AND SCIENCES

B.Sc. Mathematics

2022-2026 Batch

B. Sc. - Mathematics

Semester-1			L	T/D	P/Pr	Credits	Learning Hours
Category	Sub-Category	Course Title					
SEC	School SEC	Industry Specific Employability Skills-I	1	0	0	1	30
FIC	School FIC	Introduction to Physics	3	0	1	4	120
FIC	School FIC	Introduction to Mathematics	4	0	0	4	120
FIC	School FIC	Introduction to Chemistry	3	1	0	4	120
FIC	School FIC	Introduction to Computer Science and Programming Using C	3	0	1	4	120
FIC	School FIC	A Primer to Biology	3	0	1	4	120
			17	1	3	21	
Semester Total							**630**
Semester-2			L	T/D	P/Pr	Credits	Learning Hours
Category	Sub-Category	Course Title					
AEC	University AEC	Introduction to Communicative English	4	0	0	4	120
VAC	University VAC	Environmental science	4	0	0	4	120
SEC	School SEC	Skill Based Courses	3	0	0	3	90
CC	Core	Algebra-1	4	0	0	4	120
CC	Core	Discrete Mathematics and Combinatorics.	4	0	0	4	120
CC	Core	Real Analysis-1	4	0	0	4	120
CC	Core	Linear Algebra	4	0	0	4	120
			27	0	0	27	
Semester Total							**810**

Semester-3			L	T/D	P/Pr	Credits	Learning Hours
Category	Sub-Category	Course Title					
AEC	School AEC	Problem Solving Skills	1	0	1	2	60
VAC	School VAC	Co Curricular Activities	0	0	2	2*	0
VAC	School VAC	Community Engagement	2	0	0	2*	0
SEC	Department /School SEC	Digital literacy	2	0	0	2	60
CC	Core	Complex Analysis	3	1	0	4	120
CC	Core	Real Analysis -2	3	1	0	4	120
CC	Core	Ordinary Differential Equation -1	3	1	0	4	120
OE/Minor	OE/Minor		3			3	90
			15	3	1	19	
Semester Total							**570**
Semester-4			L	T/D	P/Pr	Credits	Learning Hours
Category	Sub-Category	Course Title					
AEC	School AEC	Creativity and Critical thinking Skills	1	0	1	2	60
VAC	School VAC	Co Curricular Activities	0	0	2	2*	0
VAC	School VAC	Community Engagement	2	0	0	2*	0
SEC	Department /School SEC	Mathematical Modelling of Physical Data				2	60
CC	Core	Probability and Statistics	3	1	0	4	120
CC	Core	Numerical Analysis	3	1	0	4	120
CC	Core	General Topology	3	1	0	4	120
OE/Minor	OE/Minor		3			3	**90**
			15	3	1	19	
Semester Total							**570**

Semester-5			L	T/D	P/Pr	Credits	Learning Hours
Category	Sub-Category	Course Title					
VAC	School VAC	Co Curricular Activities	0	0	2	2*	
VAC	School VAC	Community Engagement	2	0	0	2*	
SEC	SEC Elective	Linear Programming Problem	3	0	0	**3**	90
CC	Core	Real Analysis - 3	3	1	0	4	120
CC	Core	Partial Differential Equations-1	3	1	0	4	120
CC	Core	Measure Theory/ Data Structures and Algorithms	3	1	0	4	120
CC	Core	Number Theory and Introduction to Cryptography	3	1	0	4	120
OE/Minor	OE/Minor		3			3	90
			18	4	0	22	
Semester Total							**660**
Semester-6			L	T/D	P/Pr	Credits	Learning Hours
Category	Sub-Category	Course Title					
VAC	School VAC	Co Curricular Activities	0	0	2	2	60
VAC	School VAC	Community Engagement	2	0	0	2	60
SEC	SEC Elective	Matlab, Sage and Mathematica	2	0	1	**3**	90
CE/SE	Department	Algebra – 2 (For Pure Math)/ Mechanics and Tensor Calculus (For Applied Math)/ Applied Statistics (For Data Science and Industrial Mathematics)	3	1	0	4	120
CE/SE	Department	Functional Analysis (For Pure and Applied Math)/ Applied linear algebra (For Data Science and Industrial Mathematics)	3	1	0	4	120
CE/SE	Department	Algebraic Topology (For Pure Math)/ ODE - 2 (For Applied Math)/ Financial Mathematics	3	1	0	4	120

		(For Data Science and Industrial Mathematics)					
OE/Minor	OE/Minor		3			3	90
			16	3	3	22	

Semester Total							**660**

Semester-7			L	T/D	P/Pr	Credits	Learning Hours
Category	**Sub-Category**	**Course Title**					
CE/SE	Department	Algebra -3 (Galois Theory) (For Pure Math)/ PDE - 2 (For Applied Math)/ Regression analysis (For Data Science and Industrial Mathematics)	3	1	0	4	120
CE/SE	Department	Operator Theory (For Pure Math)/ Dynamical Systems (For Applied Math)/ Stochastic process and Stochastic Differential Equations (For Data Science and Industrial Mathematics)	3	1	0	4	120
CE/SE	Department	Core Elective - 1	3	1	0	4	120
RDIP	Internship / Research / Thesis	Internship	0	0	4	4	**120**
OE/Minor	OE/Minor		3			3	90
			12	3	4	19	

Semester Total							**570**

Semester-8			L	T/D	P/Pr	Credits	Learning Hours
Category	**Sub-Category**	**Course Title**					
RDIP	Department /Company	Research Project	0	0	12	12	360
			0	0	12	12	

Semester Total							**360**

Complex Analysis

Course Description: Complex Analysis is a fundamental course that explores the properties and applications of complex numbers and functions. This course provides students with a deep understanding of complex analysis and its relevance in various branches of mathematics, physics, engineering, and other scientific disciplines. The course covers topics such as Complex Numbers and Functions, Complex Differentiation, Complex Integration, Power Series and Analytic Continuation, Conformal Mapping and Special Functions.

Real Analysis -2

Course Description: The course Analysis 2 provides students with a solid foundation in key concepts and techniques of mathematical analysis and topology. The course covers topics related to Riemann integration, sequences and series of functions, metric spaces, and topological aspects of metric spaces.

Ordinary Differential Equation -1

Course Description: The course on Differential Equations and Systems provides students with a comprehensive understanding of differential equations and their applications. This course covers topics related to ordinary and partial differential equations, their formation, solutions, and various solution techniques. It also explores systems of ordinary differential equations and their qualitative analysis.

Semester-IV

Mathematical Modelling of Physical Data

Course Description: This course equips students with essential mathematical and statistical tools to analyze and interpret real-world experimental data. Topics covered include probability, distribution, mean, variance, standard deviations, different distribution functions, the central limit theorem, and error analysis techniques. Practical application is emphasized through hands-on activities using Python for graphical and numerical analysis. Students learn error analysis techniques, including precision, accuracy, types of errors, significant digits, round-off, error propagation, weighted average, least-square fitting, and chi-squared test. The course includes a project component where students solve numerical problems, such as climate change trend analysis or analyzing stock market stylized facts, using Python and prepare project reports using LaTeX. Offered jointly by the Physics and Mathematics departments, the course highlights the interdisciplinary nature of analyzing and interpreting experimental data.

Probability and Statistics

Course Description: The course Probability and Statistics provides students with a comprehensive understanding of probability theory, statistical distributions, estimation, hypothesis testing, and data analysis using the R programming language. The course covers topics ranging from foundational concepts in probability theory to statistical inference and data visualization techniques.

Numerical Analysis

Course Description: The course on Numerical Methods for Scientific Computing provides students with the necessary tools and techniques to solve complex mathematical problems using numerical approaches. The course covers topics such as accuracy and numerical solutions of nonlinear equations, numerical solutions of linear systems of equations, interpolation, numerical differentiation, numerical integration, and initial value problems in ordinary differential equations.

General Topology

Course Description: The course on Topology and Continuity provides students with a solid understanding of fundamental concepts and principles in topology, focusing on topological spaces, continuous functions, connectedness, compactness, continuity axioms, and separation axioms. Students will explore the properties and structures of topological spaces, investigate various types of continuity, and examine key separation properties.