

Program Schemes for B. Sc. (Hons. / Hons. with Research) Mathematics (MT201)

Cluster: Science

Institute: UIS

Department: Mathematics

Type of Program: UG

First Year				Second Year			
Semester-1	Course Name	Course Category	Credits	Semester-3	Course Name	Course Category	Credits
	Algebra and Trigonometry	Major Core	3		Object Oriented Programming with C++	Major Core	3
	Calculus	Major Core	4		Modern Algebra	Major Core	3
	Fundamentals of Programming	Major Core	3		Probability Distributions	Major Core	3
	Communication Skills-1	Skill Enhancement	1		IDC-3 (Minor Elective-3)	Minor Elective	3
	IDC-1 (Minor Elective-1)	Minor Elective	3		Social Internship	Internship	2
	Design Thinking and creativity for Innovation	Skill Enhancement	1		General Proficiency-3	Skill Enhancement	1
	General Proficiency-1	Ability Enhancement	1		Entrepreneurship Mindset	Ability Enhancement	1
	Universal Human Values, Ethics & Life Skills-1	Value Education	1		Critical Enquiry and Research Methodology	Ability Enhancement	1
	IDC-1 (Minor Elective) Basket				Universal Human Values, Ethics and Life Skills-2	Value Education	2
State of Matter and Ionic Equilibria	Minor Elective	3	IDC-3 (Minor Elective) Basket				

	Mechanics	Minor Elective	3		Polymer Chemistry	Minor Elective	3
	Data Structure	Minor Elective	3		Wave and Optics	Minor Elective	3
	Descriptive Statistics	Minor Elective	3		Software Engineering	Minor Elective	3
	Combinatorial Mathematics	Minor Elective	3		Statistical Inference	Minor Elective	3
					Combinatorial Optimization	Minor Elective	3
Semester -2	Multivariable Calculus	Major Core	3	Semester-4	Linear Algebra	Major Core	2
	Ordinary Differential Equations	Major Core	4		Real Analysis	Major Core	3
	Problem Solving & AI Applications in Mathematics	Major Core	3		Partial Differential Equations	Major Core	4
	Coordinate Geometry	Major Core	3		Python Programming Lab	Major Core	1
	R Programming	Major Core	1		Open Elective	Open Elective	3
	Professional Soft Skills-1	Skill Enhancement	1		Sub Stream Course-1	Minor Core	3
	Aptitude and Reasoning-1	Ability Enhancement	1		General Proficiency-4	Skill Enhancement	1
	IDC-2 (Minor Elective-2)	Minor Elective	3		Introduction to AI	Ability Enhancement	1
	Communication Skills-2	Skill Enhancement	1		[Track: Innovation] Marketing & Management Essentials OR	Ability Enhancement	1
	Professional Ethics	Ability Enhancement	1		[Track: Research] Academic Writing OR	Ability Enhancement	1
	General Proficiency-2	Ability Enhancement	1		[Track: Employability] Aptitude and Reasoning-2	Ability Enhancement	1

Environmental Science & Management	Value Education	2	[Track: Innovation] Business Planning & Legal Basics OR	Skill Enhancement	1
IDC-2 (Minor Elective) Basket			[Track: Research] Emerging Research Tools and Technologies OR	Skill Enhancement	1
Electrochemistry & Surface Chemistry	Minor Elective	3	[Track: Employability] Professional Soft Skills-2	Skill Enhancement	1
Electricity and Magnetism	Minor Elective	3	Mid-Grade Project-1 (MGP-1)	Project (PR)	1
Computer Networks	Minor Elective	3	Sub Stream Course-1		
Probability Theory	Minor Elective	3	Coding Theory	Minor Core	3
Discrete Mathematics and Graph Theory	Minor Elective	3	Statics and Dynamics	Minor Core	3
			Mathematics for Machine Learning	Minor Core	3

Third Year				Fourth Year			
Semester -5	Course Name	Course Category	Credits	Semester-7	Course Name	Course Category	Credits
	Complex Analysis	Major Core	3		Advanced Optimization Techniques	Major Core	4
	Numerical Methods	Major Core	4		Fundamental of LaTeX	Major Core	1
	Open Elective	Open Elective	3		Advance Complex Analysis	Major Core	3
	Sub Stream Course-2	Minor Core	3		Data Visualisation	Major Core	3
	Sub Stream Course-3	Minor Core	3		Major Elective-1	Major Elective	3
	Domain Internship	Internship	1		IDC-4 (Minor Elective-4)	Minor Elective	3
	Logic and Sets	Ability Enhancement	2		Certification	Minor Core	2
	Introduction to SDGs	Value Education	1		Dissertation - 1/Capstone Project-1	Dissertation/Project	4
	Sub Stream Course-2 and 3				Industry Internship	Internship	1
	Cryptography	Minor Core	3		Research Gap Course/ Project Gap Course	Minor Core	1
	Actuarial Mathematics	Minor Core	3		Major Elective-1 Basket		
	Finite Element Methods	Minor Core	3		Game Theory and Inventory Control	Major Elective	3
	Integral Transform	Minor Core	3		Analysis and Manifolds	Major Elective	3
	Theory of Computation	Minor Core	3		Analytical Geometry	Major Elective	3
	Machine Learning	Minor Core	3		Topology	Major Elective	3
					Green Chemistry	Minor Elective	3

					Thermodynamics	Minor Elective	3
					Mobile Computing	Minor Elective	3
					Sampling Theory and Design of Experiments	Minor Elective	3
					Number Theory	Minor Elective	3
Semester-6	Integral Equations	Major Core	3	Semester-8	Major Elective-2	Major Elective	3
	Fuzzy Set Theory and Applications	Major Core	3		Major Elective-3	Major Elective	3
	Optimization Techniques	Major Core	4		Minor Elective	Minor Elective	2
	Mid-Grade Project-2 (MGP-2)	Project (PR)	1		Dissertation - 2/Capstone Project-2	Dissertation/Project	8
	Sub Stream Course-4	Minor Core	3		Major Elective-2 Basket		
	Sub Stream Course-5	Minor Core	3		Industrial Statistics	Major Elective	3
	Open Elective	Open Elective	3		Measure Theory	Major Elective	3
	Mathematical Modelling and Simulation Techniques	Skill Enhancement	2		Space Dynamics	Major Elective	3
	Gender Equity and Empowerment	Value Education	1		Major Elective-3 Basket		
	Sub Stream Course-4 and 5				Differential Geometry	Major Elective	3
	Operator Theory	Minor Core	3		Functional Analysis	Major Elective	3
	Reimann Integration and Series of Functions	Minor Core	3		Mathematical Finance	Major Elective	3

	Fluid Dynamics	Minor Core	3	Minor Elective		
	Calculus of Variations	Minor Core	3			
	Deep Learning	Minor Core	3	Introduction to Laser & Fiber optics	Minor Elective	2
	Big Data Analytics	Minor Core	3	Distributed Computing	Minor Elective	2
				Vital Statistics	Minor Elective	2

Elective Basket

Pure Mathematics			
Semester	Course Name	Course Category	Credits
4	Coding Theory	Minor Core	3
5	Cryptography	Minor Core	3
5	Actuarial Mathematics	Minor Core	3
6	Operator Theory	Minor Core	3
6	Reimann Integration and Series of Functions	Minor Core	3
Applied Mathematics			
Semester	Course Name	Course Category	Credits
4	Statics and Dynamics	Minor Core	3
5	Finite Element Methods	Minor Core	3
5	Integral Transform	Minor Core	3
6	Fluid Dynamics	Minor Core	3
6	Calculus of Variations	Minor Core	3
Mathematical Computing & Machine Learning			
Semester	Course Name	Course Category	Credits
4	Mathematics for Machine Learning	Minor Core	3
5	Theory of Computation	Minor Core	3
5	Machine Learning	Minor Core	3
6	Deep Learning	Minor Core	3
6	Big Data Analytics	Minor Core	3
Major Elective-1			
Semester	Course Name	Course Category	Credits
7	Game Theory and Inventory Control	Major Elective	3
7	Analysis and Manifolds	Major Elective	3
7	Analytical Geometry	Major Elective	3
7	Topology	Major Elective	3

Major Elective-2			
Semester	Course Name	Course Category	Credits
8	Industrial Statistics	Major Elective	3
8	Measure Theory	Major Elective	3
8	Space Dynamics	Major Elective	3
Major Elective-3			
Semester	Course Name	Course Category	Credits
8	Differential Geometry	Major Elective	3
8	Functional Analysis	Major Elective	3
8	Mathematical Finance	Major Elective	3
Minor Elective			
Chemistry			
Semester	Course Name	Course Category	Credits
1	State of Matter and Ionic Equilibria	Minor Elective	3
2	Electrochemistry & Surface Chemistry	Minor Elective	3
3	Polymer Chemistry	Minor Elective	3
7	Green Chemistry	Minor Elective	3
8	Fertilisers and Agrochemicals	Minor Elective	2
Physics			
Semester	Course Name	Course Category	Credits
1	Mechanics	Minor Elective	3
2	Electricity and Magnetism	Minor Elective	3
3	Wave and Optics	Minor Elective	3
7	Thermodynamics	Minor Elective	3
8	Introduction to Laser & Fiber optics	Minor Elective	2
Computer Science			
Semester	Course Name	Course Category	Credits
1	Data Structure	Minor Elective	3
2	Computer Networks	Minor Elective	3
3	Software Engineering	Minor Elective	3
7	Mobile Computing	Minor Elective	3
8	Distributed Computing	Minor Elective	2
Statistics			
Semester	Course Name	Course Category	Credits
1	Descriptive Statistics	Minor Elective	3
2	Probability Theory	Minor Elective	3
3	Statistical Inference	Minor Elective	3
7	Sampling Theory and Design of Experiments	Minor Elective	3
8	Vital Statistics	Minor Elective	2
Combinatorial Mathematics			
Semester	Course Name	Course Category	Credits
1	Combinatorial Mathematics	Minor Elective	3
2	Discrete Mathematics and Graph Theory	Minor Elective	3



3	Combinatorial Optimization	Minor Elective	3
7	Number Theory	Minor Elective	3

4th Year Curriculum Design Framework [For Hons. / Hons. with Research Tracks of Four Year Undergraduate Programs (FYUP)]

Extending Expertise	Course Category	Credits	Contextualizing Learning	Course Category	Credits	Experiential Learning	Course Category	Credits
Advanced Optimization Techniques	Major Core	4	Major Elective-1	Major Elective	3	Dissertation - 1/Capstone Project-1	Dissertation/Project	4
Fundamental of LaTeX	Major Core	1	Major Elective-2	Major Elective	3	Research/Project Gap Course	Minor Core	1
Advance Complex Analysis	Major Core	3	Major Elective-3	Major Elective	3	Certification	Minor Core	2
Data Visualisation	Major Core	3	Minor Elective	Minor Elective	2	Industry Internship	Internship	1
Minor Elective-4	Minor Elective	3				Dissertation -2/ Capstone Project-2	Dissertation/Project	8