

Department of Mathematics & Statistics Evaluation Scheme of Undergraduate & Post Graduate Program as per NEP-2020 Guidelines

B.Sc. (Hons) Mathematics Four Year program with Double Majors, Second Major (Statistics/Computers/Physics/Chemistry) w.e.f. Session 2024-25

										w.e.i. Session 20	724-25
Cumulative m		num	Subject I: Mathematics	Anyone	Subject II: Statistics/Computers/Physics/Chemistry Major	Subject III Minor Elective	Vocational Minor	Co-curricular Minor	Audit Course*	Research Project**	Total
(Required for the		ard of	Major 4/5/6 Credits		4/5/6 Credits	4/5/6 Credits	3 Credits	2.	Compulsory Non-credits	Major 4 Credits	credit
Certificat Diploma/De	es/		Own Faculty	Choose	Own Faculty (Choose Anyone)	Any Faculty	Vocational/ Skill Development Course	Co-curricular (Qualifying)	Audit Course (Qualifying)	Inter/Intra Faculty related to main subject	(Year)
	Y			Statistics	B060101T/ MT139 Descriptive Statistics (Univariate) & Theory of Probability (T-4) B060102P/ MT140 Descriptive Data Analysis Lab (Univariate) (P-2)						
			B030101T/MT136:	Computers	B070101T/ CS127 Problem Solving using Computer (T-4) B070102P/ CS128 Software Lab using Python (P-2)		I030103V/ MT143				
Certificate in Science (Mathematics& Statistics OR		I	Differential Calculus & Integral Calculus (T4) B030102P/MT137: Practical using Mathematica /MATLAB (P2)	PHYSICS	B010101T/ PY113 Mathematical Physics & Newtonian Mechanics (T-4) B010202P/PY116 Thermal Properties of Matter & Electronic Circuits (P-2)		Introduction to LaTeX (V-3) OR • MOOCs/SWAYAM etc. (T+P=3)	Z010101T/BE105 Food,NutritionandHygi ene (T-2)	A050101T/HM101 RashtraGaurav		40
Mathematics & Computers OR Mathematics & Physics OR Mathematics & Chemistry)	1			Chemistry	B020101T/CH151: Fundamentals of Chemistry-I (T4) B020102P/CH134: Quantitative Analysis (P2)						40
40		II	B030201T/MT138: Matrices and Differential Equations &	STATISTICS	B060201T/ MT141 Descriptive Statistics (Bivariate) & Probability Distributions (T-4) B060202P/ MT142 Descriptive Data Analysis Lab (Bivariate) (P-2)	• ES115/BM186 Fundamentals of Environmental Science OR • A0402091/LN109 Basics of	I030202V/MT144 LaTeX -Scientific Writing (V-3)	Z020201T/NS110 FirstAidand Health (T-2)	B060203T/MT153 Advanced Application of Artificial Intelligence		
			Geometry (T6)	Computers	B070201T/ CS129 Database Management Systems (T-4) B070202P/ CS130 Database Management Systems Lab(P-2)	Communication OR BS (4+2=6)	• MOOCs/SWAYAM etc. (T+P=3)	2)	in Mathematical Sciences		

				Chemistry	B010201T/PY115 Thermal Physics & Semiconductor Devices (T-4) B010202P/PY116 Thermal Properties of Matter & Electronic Circuits(P-2) B020201T/CH139: Bioorganic and Materials Chemistry (T4) B020202P/CH141: Biochemical Analysis (P2)						
				STATISTICS	B060301T/MT230 Theory of Estimation & Sampling Survey (T-4) B060302P/MT231 Sampling Survey Lab (P-2)						
DIPLOMA in Science (Mathematics& Statistics OR Mathematics & Computers OR Mathematics &	2	III	B030301T/MT228: Algebra & Mathematical Methods (T6)	CHEMSTRY PHYSICS COMPUTERS	B070301T/CS273 Operating Systems (T-4) & B070302P/CS274 Operating Systems Lab (P-2) B010301T/PY207 Electromagnetic Theory & Modern Optics (T-4) B010302P/PY208 Demonstrative Aspects of Electricity & Magnetism (P-2) B020301T/CH232: Chemical Dynamics & Coordination Chemistry (T4) B020302P/CH234: Physical Analysis(P2)		I030302V/MT234 Introduction to R (V-3 OR •MOOCs/SWAYAM etc. (T+P=3)	Reginal Languages*** (T2)			40
Physics OR Mathematics & Chemistry) 40+40=80		IV	B030401T/MT229: Differential Equation &	STATISTICS	B060401T/ MT232 Testing of Hypothesis & Applied Statistics (T-4) B060402P/ MT233 Test of Significance & Applied Statistics Lab (P-2)	A040405T/LN234 Effective Professional Communication		Z040401T/PH201 PhysicalEducationand Yo ga	333 Mar	hematics	
			Mechanics (T6)	COMPUTERS	B070401T/CS275 Computer System Architecture (T-4) & B070402P/CS276 Computer System Architecture Lab (P-2)	Skills OR • EVS/BS (4+2=6)		ga (T-2)	Pro	ect-1(R-3)	

			CHEMISTRY PHYSICS	(B010401T/PY209 Perspectives of Modern Physics & Basic Electronics (T-4) B010402P/PY210 Basic Electronics Instrumentation (P-2) B020401T/CH239: Quantum Mechanics and Analytical Techniques (T4) B020402P/CH241: Instrumental Analysis (P2)	hysics OR Chemistr	v & Mathematics		
	ſ			3-Year, UG Degree in Chemistry & P B060501T/MT327 Multivariate Analysis &	hysics OR Chemistry	y & Mathematics		
		B030501T/MT320: Group	RS STATISTICS	Non- Parametric Methods (T-4) B060502T/ MT328 Analysis of Variance & Design of Experiments (T-4) B060503P/ MT329 Non-Parametric Methods & Design of Experiments Lab (P-2) B070501T/CS365 Analysis of Algorithms and Data Structures (T-4)				
3-Year B.Sc.		and Ring Theory & Linear Algebra (T5) • B030502T/MT321: Number Theory & Game	COMPUTERS	B070502T/ CS366 Soft Computing (T-4) B070503P/ CS367 Lab on Algorithms and Data Structures with C++ (P-2)				
in (Mathematics & Statistics OR Mathematics & Computers OR Mathematics & Physics		Theory OR • B030503T/MT322: Grap Theory & Discrete Mathematics OR • B030504T/MT323: Differential Geometry & Tensor Analysis (T5)	h hHYSICS	B010501T/ PY311 Classical & Statistical Mechanics (T-4) B010502T/ PY312 Quantum Mechanics & Spectroscopy (T-4) B010503P/ PY313 Demonstrative Aspects of Optics & Lasers (P-2)				40
OR Mathematics & Chemistry) 80+50=130 (120)			CHEMISTRY	B020501T/CH337: Organic Synthesis-A (T4) B020502T/CH338: Rearrangements and Chemistry of Group Elements (T4) B190503P/CH339: Qualitative Analysis (P2)				
	V	B030601T/MT324: Metric Space & Complex Analysis (T4) B030602T/MT325: Numerical Analysis & Operations Research (T4)	STATISTICS	B060601T/ MT330 Statistical Computing & Introduction to Statistical Software (T-4) B060602T/ MT331 Operations Research (T-4) & B06060 MT332 Operations Research & Statistical Computing Lab (P-2)				

		B030603P/MT326: Practical on Numerical Analysis using Mathematica /MATLAB (P2)	CHEMISTRY PHYSICS COMPUTERS	B070601T/CS368 Data Communication and Computer Networks (T-4) & B070602T/CS369 Cyber Security & Cyber Laws (T-4) & B070603P/CS370 Lab on Computer Networks (P-2) B010601T/PY314 Solid State & Nuclear Physics (T-4) B010602T/PY315 Analog & Digital Principles & Applications (T-4) B010603P/PY316 Analog & Digital Circuits (P-2) B020601T/CH353: Organic Synthesis-B (T4) B020602T/CH354: Chemical Energetics and Radiochemistry (T4) B020603P/CH355: Analytical Methods (P2)					
	<u> </u>			4-Year UG Degree with Honours (<75%	Marks) Choose	e Anyone Specializatio	n		
		MATHEMATICS B030701T/MT434 Real & Complex Analysis (T-4) B030702T/ MT435 Advanced Modern Algebra (T-4)							
4-Year B.Sc. in MATHEMATICS with Honours OR STATISTICS with Honours	VII 4		_						40
130+40=170 (160)		B030801T/ MT438 Advanced Mathematical Modeling & Computing through C(T-4)							
	VIII	B030704T/ MT437 Discrete Structures (T-4)							

		B030802T/ MT439 Geometry of Manifold-I (T-4) (B030803T/ MT440) Numerical Analysis with Application (T-4) (B030804T/ MT441) Advanced Linear Algebra (T-4) (B030805P/ MT442) Advanced Numerical Analysis Lab (P-4)	4 Voor UC Dogree with Honours & Research	sch (>759/, Marks) Chasse Anyone Specialization		
4-Year B.Sc. in MATHEMATICS with Honours&	4	B030701T/MT434 Real & Complex Analysis (T-5) B030702T/ MT435 Advanced Modern Algebra (T-5) B030703T/ MT436 Ordinary & Partial Differential Equations (T-5) B030704T/ MT437 Discrete Structures (T-5) B030701T/MT434 Real & Complex Analysis (T-5) B030801T/ MT438 Advanced	4-Year UG Degree with Honours & Research		B030604R/ MT334 Mathematics Project-2 (R-3) OR B060705R/MT4 45 Statistics Research Project-1 (R-6)	40
Research 130+40=170 (160)	VI	Differential Geometry (T-4) B030802T/ MT439 Optimization & Statistical Techniques (T-4)			B030806R/ MT444 Mathematics Research Project- 2 (R-6) OR B060805R/MT4 46 Statistics Research Project- 2 (R-6)	
M.Sc. in MATHEMATICS 170+40=210	5 I	B030901T/ MT538 Geometry of Manifolds (T-5) B030902T/ MT539 Integral Equations with boundary value			B030905R/ MT546 Mathematics Research Project-	40

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(200)		problem (T-5) B030903T/ MT540 Fluid			3(R-6) OR
		Dynamics with Application (T-5)			060906R/MT5
		B030904T/ MT541 Special			50 Statistics search Project-
		Function (T-5)			3(R-6)
		B031001T/ MT542 Mechanics with Application (T-5)			B031005R/ MT547
		B031002T/ MT543 Functional Analysis and variational			Mathematics search Project-
	v	inequality (T-5)			4 (R-6)
	X	B031003T/ MT544 Calculus of Variations with Application (T-			OR 061005R/MT5
		5)			51 Statistics esearch Project
		B031004T/ MT545 Advanced Topology (T-5)			4 (R-6)
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- ✓ T-4 = Theory with 4 credits; P-2 = Practical with 2 credits; R = Research Project with 4 credits; Q: Qualifying; NC = Non-Credit; MOOCs = Massive Online Open Courses
- ✓ Co-curricular courses offered by UP higher education.
- ✓ Vocational courses offered by respective Department/University
- *Audit Courses: The respective Department/University offers Rashtra Gaurav and X+AI (Advanced Application of Artificial Intelligence in Mathematical Sciences) as compulsory **Non-Credit** courses. All students will have to pass these curses for obtaining a Certificate, Diploma, Undergraduate Degree, or Undergraduate Honors Degree with Research only once.
- ✓ 01,02, and 03 combinations are elective papers, out of which students must choose any one with a minimum of ten students' strengths.
- For entry into the 4-Year UG Degree with Honours and Research program, students must secure ≥75% marks in the 3-Year UG Degree program.
- ✓ Students with a 3-Year Single Subject with Honours UG Degree below 75% marks in the 3-Year UG Degree program go for a two-year PG program.
- ✓ **Research Project/Dissertation/Internship/Field or Survey Work etc.
- ***Regional Language is a co-curricular course offered by the respective Department or University in the third semester, such as Hindi, Urdu, Awadhi, Sanskrit, etc.



(With Effect From: 2024 - 25)

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		Subject I	Subject II	Subject III	**Vocational	Co-curricular	Research project		Cumulative
		Major	Minor	Audit Course	Minor	Minor	Major	Minimum	minimum credits
		4/5/6 Credits	4/5/6 Credits	Non - Credit	3 Credits	2 Credits	12	Credits	(Required for the
Y.	Sem.	Own Faculty	Own/ Other Faculty	Audit/ Non- Credit Course	Vocational/ Skill development course	Co-curricular	Inter/Intra Faculty related to main subject	(Year)	award of certificates/ diploma/degree)
	I	B030101T/ MT136 Differential Calculus & Integral Calculus (T-4) B030102P/ MT137 Practical using Mathematica /MATLAB (P-2)		(A050101T/H M101) Rashtra	I030103V/MT143 Introduction to LaTeX (V-3) OR	(Z010101T/ BE105) Food, Nutrition and Hygiene			
		B030103T/MT158 Trigonometry and Set Theory (T-6)		Gaurav (T-0)	MOOCs/SWAYAM etc. (T+P=3)	(T-2)			
1		B030201T/ MT138 Matrices and Differential Equations & Geometry (T-6)	Choose any ONE from the Followings: (a) (B070201T/CS129) Database Management Systems (T-4) + (B070202P/CS130) Database Management	B060203T/MT153 Application of	I030202V/ MT144			40 (30 + 6 + 4) (First Year)	40 (Certificate in Mathematics)
	II	B030202T/MT159 Vector Analysis and Vector Calculus (T-6)	Systems Lab (P-2) (b) B060201T/ MT141 Descriptive Statistics (Bivariate) (T-4) & Probability Distributions B060202P/ MT142 Descriptive Data Analysis Lab (Bivariate) (P-2) (c) (B010201T/ PY115)	Artificial Intelligence in Mathematical Sciences (T-0)	LaTeX -Scientific Writing (V-3) OR MOOCs/SWAYAM etc. (T+P=3)	(Z020201T/ NS110) First Aid and Health (T-2)			



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			Thermal Physics and Semiconductor Device (T-4) + (B010202P/PY116) Thermal Properties of Matter and Electronic Circuits (P-2)						
		Subject I	Subject II	Subject III	**Vocational	Co-curricular	Research project		Cumulative
		Major	Minor	Audit Course	Minor	Minor	Major	Minimum	minimum credits
		4/5/6 Credits	4/5/6 Credits	Non - Credit	3 Credits	2 Credits	12	Credits	(Required for the
Y.	Sem.	Own Faculty	Own/ Other Faculty	Audit/ Non- Credit Course	Vocational/ Skill development course	Co-curricular	Inter/Intra Faculty related to main subject	(Year)	award of certificates/ diploma/degree)
	III	B030301T/ MT228 Algebra & Mathematical Methods (T-6)			I030302V/MT234 Introduction to R (V-	Indian / Regional Language			
2	111	B030302T/MT242 Theory of real function (T-6)			3 OR MOOCs/SWAYAM etc. (T+P=3)	(T-2)		40 (30 + 3 + 4 + 3) (Second Year)	80 (Diploma in Mathematics)
	IV	B030401T/ MT229 Differential Equation & Mechanics (T-6)	Choose any ONE from the Followings: (a) Testing of Hypothesis & Applied			(Z040401T) Physical Education and Yoga (T-2)	B030505R/MT3 33 Mathematics Project-1(R-3)		



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	Sta	atistics(T4)			
	(B0604	-01T/MT232)+			
	Testin	g of Hypothesis			
	and A	pplied Statistical			
	Lab (F				
	(B0604	.04P/MT241)			
	tion and series of function (T-6) Quanto and series of function Tec (BC)	220401T/CH239) antum Mechanics d Analytical chniques (T-4) + 220402P/CH241) trumental Analysis 2)			
		B070401T/CS275)			
		Computer System			
		Architecture (T-4) +			
		(B070402P/CS276) Computer System			
	Ar	chitecture Lab (P-2)			

			Subject I	Subject II	Subject III	**Vocational	Co-curricular	Research project		Cumulative
			Major	Minor	Audit Course	Minor	Minor	Major	Minimum	minimum credits
			4/5/6 Credits	4/5/6 Credits	Non - Credit	3 Credits	2 Credits	12	Credits	(Required for the
3	Υ.	Sem.	Own Faculty	Own/ Other Faculty	Audit/ Non- Credit Course	Vocational/ Skill development course	Co-curricular	Inter/Intra Faculty related to main subject	(Year)	award of certificates/ diploma/degree)
			B030501T/ MT320 Group and Ring Theory & Linear Algebra (T-5)					B030505R/M T333		
		1 7	B030502T/ MT321 Number Theory & Game Theory (T-5)					Mathematics	40 + 10	130 (Degree in
•	3	V	B030503T/ MT322 Graph Theory & Discrete Mathematics(T-5)					Project-1	(50) (Third	B.Sc. Honours in
			B030504T/ MT323 Differential Geometry & Tensor Analysis (T-5)					(P-5)	Year)	Mathematics)
		VI	B030604T/MT342 Differential Geometry I: Curves and Spaces					(B030605R/		



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	(T-4)			MT334 Mathematics	
	B030606T/MT343 Theory of Equations (T-4)	 	 	Project-II (P-5)	
	B030601T/ MT324 Metric Space & Complex Analysis (T-4)	 	 		
	B030602T/ MT325 Numerical Analysis & Operations Research (T-4)	 	 		
	B030603P/ MT326 Practical on Numerical Analysis using Mathematica /MATLAB (P-4)	 	 		

Award of Degree

After the completion of the 3 year UG degree, one has to pursue $4^{th}/5^{th}$ year UG/PG programmes in similar manner as double major UG/PG Programme

Case 1: If any candidate having plain B.Sc. Degree takes admission in 4th Year in Integral University in any one of those subjects which they had in their 3rd Year and then make exit after 4th Year then he/she will be awarded with

- (a) B.Sc. (H) degree in 4th Year (Applicable to all candidates) in that subject
- (b) B.Sc. (H) with Research degree in 4th Year in that subject (Applicable to those whose CGPA of first 3 years i.e. B.Sc. degree is > 7.5)

Case 2: If any candidate having Three Years B.Sc. (H) Degree takes admission in 4th Year in Integral University in that subject and make exit after 4th Year then he/she will be awarded with

- (a) B.Sc. (H) with Research Degree after 4^{th} Year (Applicable to those whose CGPA > 7.5).
- (b) They will not get any degree if they make exit after 4th Year (Applicable to those whose CGPA < 7.5). Rather, they will get Master's Degree if they complete 5th Year.