

**Course Structure of B.Tech. Programme  
in  
Mathematics and Computing  
(From AY 2023-24 onwards)**

Course structure of B.Tech. 1<sup>st</sup> year

Semester I

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
EE 1XX	Basic Electrical Engineering	1-1-0	2
ME 1XX	Engineering Mechanics	2-0-0	2
PH 101	Basics of Physics	2-1-0	3
PH 156	Physics Lab- I	0-0-2	1
MA 105 (A)	Calculus-I (half Semester)	3-1-0 (=4/2)	2
MA 105 (B)	Calculus-II (half Semester)	3-1-0 (=4/2)	2
CH 103	Chemistry	3-0-0	3
CH 153	Chemistry Lab	0-0-2	1
HS 1XX	Language and Composition	2-0-0	2
ZXXX	Flexible Elective (HSS)	1-0-0	1
NO 101	National Sports Organization (NSO)	0-0-0	P/NP
Total		14-3-4	19

Semester II

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
BSE 102	Biosciences	2-1-0	3
MA 106 (A)	Linear Algebra (half Semester)	2-1-0 (=3/2)	1.5
MA 106 (B)	Differential Equations-I (half Semester)	2-1-0 (=3/2)	1.5
ES 1XX	Environmental Studies: Scientific and Engineering Aspects (half Semester)	2-1-0 (=3/2)	1.5
HS 1XX	Environmental Studies: Social Aspects (half Semester)	2-1-0 (=3/2)	1.5
HS 108	Fundamentals of Economics	2-0-0	2
IC 1XX	Makerspace	1-0-6	4
CS 103	Computer Programming	2-0-0	2
IC 151	Computer Programming Lab	0-0-3	1.5
ZXXX	Flexible Elective	1-0-0	1
ZXXX	Flexible Elective	1-0-0	1
ZXXX	Flexible Elective (HSS)	1-0-0	1
NO 101	National Sports Organization (NSO)	0-0-0	P/NP
Total		14-3-9	21.5

2<sup>nd</sup> Year B.Tech. in Mathematics and Computing

Semester III

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ xxx	Course-I for Minor Program	X-X-X	3
MA 203(A)	Complex Analysis	3-1-0 (1/2 semester)	2
MA 203(B)	Differential Equations-II	3-1-0 (1/2 semester)	2
MA 2xx / CS 201	Discrete Mathematical Structures	2-1-0	3
MA 2xx	Foundations of Mathematical Analysis	2-1-0	3
MA 2xx	Probability and Statistics	2-1-0	3
MA 2xx / CS 203	Data Structures and Algorithms	2-1-0	3
MA 2xx / CS 253	Data Structures and Algorithms Lab	0-0-3	1.5
MA 2xx	Department Elective (DE-1)	2-1-0/2-0-2	3
Total		13-6-3/13-5-5	20.5/23.5

Semester IV

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
ZZ XXX	Course-II for Minor Program	X-X-X	3
MA 204	Numerical Methods	2-0-2	3
MA 2xx	Multivariate Calculus and Measure Theory	2-1-0	3
MA 2xx	Mathematical Logic and Theory of Computation	2-1-0	3
MA 2xx /CS 204	Design and Analysis of Algorithms	2-1-0	3
MA 2xx /CS 254	Design and Analysis of Algorithms Lab	0-0-3	1.5
MA 2xx	Department Elective (DE-2)	2-1-0	3
ZZxxx	Institute Elective-1	2-1-0	3
Total		12-5-5	19.5 / 22.5

### 3<sup>rd</sup> Year B. Tech. in Mathematics and Computing

#### Semester V

Course Code	Subject Name	Weekly Contact Hours (L-T-P)	Credits
ZZ XXX	Course-III for Minor Program	X-X-X	3
MA 3xx	Matrix Computations	2-0-2	3
MA 3xx	Data Science	2-0-2	3
MA 3xx	Techniques in Parallel Computing	1-0-2	2
MA 3xx / CS 307	Optimization Algorithms and Techniques	2-1-0	3
MA 3xx / CS 303	Operating Systems	2-1-0	3
MA 3xx / CS 357	Optimization Algorithms and Techniques Lab	0-0-2	1
MA 3xx / CS 353	Operating Systems Lab	0-0-2	1
MA 3xx	Department Elective (DE-3)	2-0-2/2-1-0	3
ZZ xxx	Institute Elective-2	2-1-0	3
Total		13-3-12/13-4-10	22/25

#### Semester VI

Course Code	Subject Name	Weekly Contact Hours (L-T-P)	Credits
MA 3xx	Statistical Inference	2-0-2	3
MA 3xx	Monte-Carlo Simulation	2-0-2	3
MA 3xx /CS 306	Computer Networks	2-0-2	3
MA 3xx / CS 304N	Computational Intelligence	2-1-0	3
MA 3xx / CS 354N	Computational Intelligence Lab	0-0-3	1.5
MA xxx	Department Elective (DE-4)	2-1-0	3
MA xxx	Department Elective (DE-5)	2-1-0	3
ZZ xxx	Institute Elective-3	2-1-0	3
Total		14-4-9	22.5

4<sup>th</sup> Year B. Tech. in Mathematics and Computing

Semester VII

Course Code	Subject Name	Weekly Contact Hours (L-T-P)	Credits
MA 499	B Tech Project (BTP) (16)	0-0-32	16
	Internship-1		1
	Internship-2		1
Total		0-0-32	18

Semester VIII

Course Code	Subject Name	Weekly Contact Hours (L-T-P)	Credits
MA 4xx	Department Elective (DE-6)	x-x-x	3
MA 4xx	Department Elective (DE-7)	x-x-x	3
ZZ xxx	Elective-IV (Institute Elective-4)	x-x-x	3
ZZ xxx	Elective-V (Institute Elective-5)	x-x-x	3
ZZ xxx	Elective-VI (Institute Elective-6)	x-x-x	3
Total		x-x-x	15

List of Flexible Elective for B.Tech. 1st Year

Semester I

Course Code	Course Title	Teaching Hours (L-T-P)	Credits
HS 1XX	Stress and Mental Health	1-0-0	1
HS 1XX	Frontiers of Thinking	1-0-0	1
HS 1XX	History of Tribal and Folk Art	1-0-0	1
HS 1XX	Cultural Sociology	1-0-0	1

Semester II

Course Code	Course Title	Teaching Hours (L-T-P)	Credits
EE 1XX	Basic Electronics Engineering	1-0-0	1
ME 1XX	Basic Manufacturing Processes	1-0-0	1
ME 1XX	Basic Thermal Engineering	1-0-0	1
PH 1XX	Basics of Laser Engineering	1-0-0	1
HS 1XX	Stress and Mental Health	1-0-0	1
HS 1XX	Frontiers of Thinking	1-0-0	1
HS 1XX	History of Tribal and Folk Art	1-0-0	1
HS 1XX	Cultural Sociology	1-0-0	1
AA 101	Introduction to Space Engineering	1-0-0	1
CE 1XX	Computations in Civil Engineering	1-0-0	1
MM 1XX	Introduction to Materials Engineering	1-0-0	1

List of the Elective Courses for 2<sup>nd</sup> Year B.Tech. in Mathematics and Computing

Semester III

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
MA 2xx	Linear Programming	2-1-0	3
MA 2xx	Introduction to Dynamical Systems	2-0-2	3

Semester IV

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
MA 2xx	Elementary Number Theory and Algebra	2-1-0	3
MA 2xx	Regression Analysis	2-1-0	3

List of the Elective Courses for 3<sup>rd</sup> Year B.Tech. in Mathematics and Computing

Semester V

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
MA 3xx	Numerical Methods for Partial Differential Equations	2-0-2	3
MA 3xx	Statistical Distribution Theory	2-1-0	3

Semester VI

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
MA 3xx	Algorithmic Techniques and Applications of Data Science	2-1-0	3
MA 3xx	Financial Engineering	2-1-0	3
MA 3xx	Random Matrices	2-1-0	3

List of the Elective Courses for 4<sup>th</sup> Year B.Tech. in Mathematics and Computing

Semester VIII

Course Code	Course Title	Weekly Contact Hours (L-T-P)	Credits
MA 452/ MA 652	Theory of Transforms	2-0-2	3
MA 407/ MA 607	Nonlinear Dynamics and Computations	2-0-2	3
MA 454 / MA 654	Mathematical Modeling and Simulations	2-0-2	3
MA 605/ MA 405	Differential Equations in Population Dynamics	2-0-2	3
MA 4XX/MA 6XX	Industrial Statistics	2-1-0	3
MA 4XX/MA 6XX	Foundation of Approximation Theory	2-1-0	3
MA 4XX/MA 6XX	Graph Theory	2-1-0	3
MA 4XX/MA 6XX	Time Series Analysis	2-1-0	3
MA 4XX/MA 6XX	Stochastic Process*	2-1-0	3
MA 4XX/MA 6XX	Integral Equations*	2-1-0	3
MA 4XX/MA 6XX	Mathematical Study of Waves*	2-1-0	3