

B.Tech in 'Mathematics and Computing' Curriculum (2022)

Semester 1 (17 credits)			
	<i>Core Courses</i>	<i>Type of course</i>	<i>Credit</i>
MA1110	Calculus I	Basic Sciences	1
MA1220	Calculus II	Basic Sciences	1
CY1010	Environmental Chemistry	Basic Sciences	2
EP1108	Modern Physics	Basic Sciences	2
MA1130	Vector Calculus	Departmental Core Theory	1
MA1240	Combinatorics	Departmental Core Theory	3
MA1000	Math Foundation	Departmental Core Theory	3
ID1063	Introduction to Programming	Basic Engineering Skills	3
BT1010	Introduction to Life Sciences	Basic Sciences (Soft Skills)	1
			17

Semester 2 (16 credits)			
	<i>Core Courses</i>	<i>Type of course</i>	<i>Credit</i>
MA1140	Elementary Linear Algebra	Basic Sciences	1
MA1150	Differential Equations	Basic Sciences	1
EP1031	Physics Lab - 1	Basic Sciences	2
MA1230	Series of Functions	Departmental Core Theory	1
MA1250	Introduction to Number Theory	Departmental Core Theory	3
AI1100	Artificial Intelligence	Basic Engineering Skills	1
EM3020	Introduction to Entrepreneurship	Liberal Arts (Soft Skills)	1
	LA/CA Electives	Liberal Arts Elective/Creative Arts	3
	<i>Departmental Elective*</i>	<i>Departmental Elective</i>	3
			16

*The elective course may be converted into core or maybe moved to some other semesters.

* Revised curriculum approved in 52nd Senate

Semester 3 (19 credits)			
	<i>Core Courses</i>	<i>Type of course</i>	<i>Credit</i>
EE1202	Digital Circuits	Basic Engineering Skills	3
ID2230	Data Structures & Applications	Basic Engineering Skills	3
MA2120	Transform Techniques	Departmental Core Theory	1
MA2150	Introduction to Metric Spaces	Departmental Core Theory	1
MA2233	Data Structures & Applications Lab	Departmental Core Laboratory	3
MA2550	Linear Algebra	Departmental Core Theory	3
MA2540	Probability Theory	Departmental Core Theory	3
LA1760	Communication Skills	Liberal Arts (Soft Skills)	2
			19

Semester 4 (18 credits)			
	<i>Core Courses</i>	<i>Type of course</i>	<i>Credit</i>
MA2101/AI2101	Convex Optimization	Departmental Core Theory	3
MA2130	Complex Variables	Departmental Core Theory	1
CS2030	Theory of Computation	Departmental Core Theory (cross listed course)	3
CS2443	Algorithms	Departmental Core Theory (cross listed course)	3
MA2030	Ordinary Differential Equations	Departmental Core Theory	3
MA2570	Applied Statistics	Departmental Core Theory	3
MA2070	Introduction to Group Theory	Departmental Core Theory	1
CS3320	Compilers-I	Basic Engineering Skills	1
			18

Semester 5 (17 credits)			
	Core Courses	Type of course	Credit
EE1206	Linear Systems and Signal Processing	Basic Engineering Skills	3
CS3510	Operating Systems I	Basic Engineering Skills	1
CS3550	DBMS 1	Basic Engineering Skills	1
MA3010	Real Analysis	Departmental Core Theory	3
MA3070	Algebra I - Groups and Rings	Departmental Core Theory	3
MA3060	Numerical Analysis	Departmental Core Theory	3
	Free Electives	Free Elective	3
			17

Semester 6 (14 credits)			
	Core Courses	Type of course	Credit
	MA Electives	Departmental Elective	3
	MA Computational Electives	Departmental Elective	3
	Basic Engineering Skills course	Basic Engineering Skills	3
	Free Electives	Free Elective	3
	LA/CA Electives	Liberal Arts Elective/Creative Arts	2
	Project optional (3 or 6 credits)		Credit
MA3615	Credited Research Project - I		3
MA3405	Industry Project		6

Note: A B.Tech Maths and Computing (M&C) student can take a Credited Research Project - I of 3 credits from the Department electives. Moreover, If an M&C student wishes to take up the **Industry project worth 6 credits**, he/she can take the same in place of the Department electives in the 6th semester worth 6 credits.

Semester 7 (16 credits)			
	Core Courses	Type of course	Credit
MA4420	Functional Analysis	Departmental Core Theory	3
	MA Electives	Departmental Elective	6
	MA Computational Electives	Departmental Elective	3
	Free Electives	Free Elective	3
LA1770	Personality development	Liberal Arts (Soft Skills)	1
	Project optional (3 credits)		Credit
MA4715	Credited Research Project - II		3

Semester 8 (12 credits)			
	Courses	Type of course	Credit
	MA Electives	Departmental Elective	6
	MA Computational Electives	Departmental Elective	3
	Free Electives	Free Elective	3
	Project optional (3 credits)		Credit
MA4715	Credited Research Project - III		3

Credited Research Projects: The Department of Mathematics offers the students of B.Tech M&C, the following option:

- (i) To undertake credited research projects worth up to a maximum of 6 credits in lieu of equal course credits.
- (ii) This can be undertaken during the 6th to 8th semesters and up to a maximum of 3 credits in any of the semesters.

B.Tech Mathematics and Computing curriculum credits distribution:

Sem	Dept Core + Elec	LA/CA	Basic Sci & Basic Eng Skills	Free Ele	Total credits	# 3 credit courses
1	7	0	10	0	17	3
2	7	4	5	0	16	1
3	11	2	6	0	19	5
4	17	0	1	0	18	5
5	9	0	5	3	17	4
6	6	2	3	3	14	
7	12	1	0	3	16	1
8	9	0	0	3	12	
Total	78	9	30	12	129	19

Split-up of 129 credits (As per 48th Senate)	Credits range	B.Tech Mathematics and Computing curriculum
Approx. 20-25% Basic Sciences & Basic Engineering Skills	26 - 33	30
Approx. 60-65% Departmental subjects	77 - 84	78
Approx. 7-8% Liberal/Creative Arts	9 - 10	9
Approx. 10% Free electives	12-13	12
		129

- Maximum of 6 LA courses or a maximum of 4 CA courses.
- **The number of 3 credits courses:** 19 courses at present. We expect more 3 credits courses from 38 credits of electives (25 credits of Dept electives and 13 credits of free electives.)
- **6 credits of Industry project** in the 6th semester in place of Dept. electives
- **Soft Skill courses:** Communication Skills, Personality development, Artificial Intelligence, Introduction to Life Sciences, Introduction to Entrepreneurship.