

## **B.Tech Mathematics and Computing Curriculum (2020)**

<b>Sem 1</b>	<b>Code</b>	<b>Credits</b>	<b>Seg</b>	<b>Remarks</b>
Calculus I	MA1110	1	12	Basic Sci
Calculus II	MA1220	1	34	Basic Sci
Modern Physics	EP1108	2		Basic Sci
Environmental Chemistry	CY1017	2		Basic Sci
Introduction to Programming	ID1063	3	16	Basic Eng Skills
English communication	LA1760	2		LA course (SS)
Math Foundation	MA1500	1		Dept. core
Combinatorics	MA1240	3	16	Dept. core
	<b>Total</b>	<b>15</b>		

<b>Sem 2</b>	<b>Code</b>	<b>Credits</b>	<b>Seg</b>	<b>Remarks</b>
Physics Lab - 1	EP1031	2		Basic Sci (lab)
Introduction to Life Sciences	BO1010	1		Basic Sci (Mandatory)
Elementary Linear Algebra	MA1140	1	12	Basic Sci
Differential Equations	MA1150	1	34	Basic Sci
Series of Functions	MA1230	1	12	Dept. core
Introduction to Number Theory	MA1250	3	16	Dept. core
Artificial Intelligence	AI1100	2		Basic Eng Skills (SS)
Bioengineering	BM1030	2		Basic Sci
LA/CA Electives		1		LA/CA Electives
Science Elective		1		Basic Sci
Introduction to Entrepreneurship		1		Mandatory course (SS)
	<b>Total</b>	<b>16</b>		

<b>Sem 3</b>	<b>Code</b>	<b>Credits</b>	<b>Seg</b>	<b>Remarks</b>
Transform Techniques	MA2120	1	34	Dept. core
Introduction to Metric Spaces	MA2150	1	56	Dept. core
Linear Algebra	MA4020	3	16	Dept. core
Probability Theory	MA4040	3	16	Dept. core
Digital Circuits	EE1202	3	16	Basic Eng Skills
Data Structures & Applications	ID2230	3	16	Basic Eng Skills
Data Structures & Applications Lab	MA2233	2	36	Dept. core (lab)
Science Elective		1		Basic Sci
	<b>Total</b>	<b>17</b>		

<b>Sem 4</b>	<b>Code</b>	<b>Credits</b>	<b>Seg</b>	<b>Remarks</b>
Introduction to Group Theory	MA2070	1	12	Dept. core
Complex Variables	MA2130	1	34	Dept. core
Ordinary Differential Equations	MA4030	3	16	Dept. core
Applied Statistics	MA4240	3	16	Dept. core
Convex Optimization	MA2101/AI2101	3	16	Dept. core
Algorithms	CS2443	3	16	Dept. cross-listed
Theory of Computation	CS2030	3	16	Dept. cross-listed
	<b>Total</b>	<b>17</b>		

<b>Sem 5</b>	<b>Code</b>	<b>Credits</b>	<b>Seg</b>	<b>Remarks</b>
Analysis of Functions of Single Variables	MA4010	3	16	Dept. core
Algebra I - Groups and Rings	MA4070	3	16	Dept. core
Numerical Analysis	MA5060	3	16	Dept. core
DBMS 1	CS3550	1		Basic Eng Skills
Operating Systems I	CS3510	1		Basic Eng Skills
Linear Systems & Signal Processing	EE1206	3		Basic Eng Skills
Free Elective		3		Free Elective
	<b>Total</b>	<b>17</b>		

Sem 6	Code	Credits	Seg	Remarks
Multivariable Calculus	MA4090	3	16	Dept. core
MA Electives	MA****	3		Dept. core
MA Computational Electives	MA****	6		Dept. core (Theory + lab)
Compilers-I	CS3320	1		Eng Skills
Free Electives		2		Free Elective
	<b>Total</b>	<b>15</b>		
Credited Research Project - I	MA3615	3		

**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.

Sem 7	Code	Credits	Seg	Remarks
Functional Analysis	MA5020	3	16	Dept. core
MA Computational Elective	MA****	3		Dept. core (Theory + lab)
MA Elective	MA****	3		Dept. core
Free Elective		4		Free Elective
LA/CA Electives		2		LA/CA Electives
Personality development		1		LA (Mandatory SS course)
	<b>Total</b>	<b>16</b>		
Credited Research Project - II	MA4715	3		

Sem 8	Code	Credits	Seg	Remarks
MA Electives	MA****	6		Dept. core
MA Computational Elective	MA****	3		Dept. core (Theory + lab)
Free Elective		3		Free Elective
LA/CA Electives		3		LA Elective
	<b>Total</b>	<b>15</b>		
Credited Research Project - III	MA4815	3		

**B.Tech MnC curriculum credits distribution:**

Sem	Dept: Core + Elec + Project	Dept. cross-listed	LA/CA	Basic Sci	Basic Engg	Free	Total credits	# 3 credit courses
1	4	0	2	6	3	0	15	2
2	4	0	1	8	2	0	16	1
3	10	0	0	1	6	0	17	4
4	11	6	0	0	0	0	17	5
5	9	0	0	0	5	3	17	4
6	12	0	0	0	1	2	15	1+
7	9	0	3	0	0	4	16	1+
8	9	0	3	0	0	3	15	0+
<b>Total</b>	<b>68</b>	<b>6</b>	<b>9</b>	<b>15</b>	<b>18</b>	<b>12</b>	<b>128</b>	<b>18+</b>

Senate: Split-up of 125-130 credits:	Credits	M&C Curriculum	Description
Approx. 12-13% basic sciences,	~ 15 - 16	15	4 from M&C + 10 Basic sci + 1 Mandatory
Approx. 12-13% basic engineering skills	~ 15 - 16	15+ 3	15 credits of Basic Eng. + AI + Entrep. course
Approx. 55-60% departmental subjects	~ 68 - 75	68+6	68 from Dept + 6 Dept. cross listed courses
Approx. 7-8% liberal/creative arts	~ 8 - 9	8+1	8 LA/CA Elective* + 1 LA Mandatory
Approx. 10% free electives	~ 12 - 13	12	
		<b>128</b>	

- **8 LA/CA Elective\*** - Maximum of 6 LA courses or a maximum of 4 CA courses.
- **The number of 3 credits courses:** 18 courses + more from 24 credits of Dept electives and 12 credits of free electives.
- **6 credits of Industry project** in the 6th semester in place of Dept. electives
- **SS courses in the curriculum:** English communication, Personality development, Artificial Intelligence, Introduction to Entrepreneurship.

**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.