



Mar Baselios College of Engineering and Technology

**CURRICULUM  
2023  
(Autonomous)  
Draft  
Version 1.0**

**B.TECH  
Computer Science and Engineering**



**MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY**  
Mar Ivanios Vidyanagar, Nalanchira, Thiruvananthapuram – 695 015  
**August 2023**



# **CURRICULUM**

FOR

**B. TECH DEGREE PROGRAMME**

IN

**COMPUTER SCIENCE AND ENGINEERING**

**2023 SCHEME  
(AUTONOMOUS)**



## **MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY**

(Approved by AICTE, Autonomous Institution Affiliated to APJ Abdul Kalam Technological University)

MAR IVANIOS VIDYANAGAR, NALANCHIRA, THIRUVANANTHAPURAM – 695015, KERALA.

Phone: 0471 2545866

Fax: 0471 2545869

Web: [www.mbcet.ac.in](http://www.mbcet.ac.in)

email: [hodcs@mbcet.ac.in](mailto:hodcs@mbcet.ac.in)

---

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

*For the students admitted from 2023*

### Scheduling of Courses

#### i) Knowledge Segments and Credits

Every course of B. Tech Programme is placed in one of the nine categories as listed in the following table.

No semester shall have more than six lecture-based courses and two laboratory courses, and/or drawing/seminar/project courses in the curriculum.

Sl. No.	Category	Category Code	2020(REVISED)	2023(REVISED)
1	Humanities and Social Sciences including Management Courses	HSC	5	6
2	Basic Science Courses	BSC	26	26
3	Engineering Science Courses	ESC	22	22
4	Programme Core Courses, Comprehensive Course Work and Viva Voce	PCC	79	69
5	Programme Elective Courses	PEC	15	18
6	Institute Elective Courses	OEC/IEC	3	6
7	Project Work and Seminar	PWS	10	13
8	Mandatory Non-credit Courses (P/F) with Grade	MNC	---	--
9	Mandatory Student Activities (P/F)	MSA	2	3
<b>Total Mandatory Credits</b>			<b>162</b>	<b>163</b>
	Value Added Courses (Optional) – Honours/Minor	VAC	15	15

#### ii) Semester-wise Credit Distribution

Semester	I	II	III	IV	V	VI	VII	VIII	Total Credits
<i>Credits for Courses</i>	17	21	22	23	22	22	18	15	<b>160</b>
	38		45		44		33		<b>160</b>
<i>Credits for Activities</i>	3								<b>3</b>
<i>Total Credits</i>									<b>163</b>
<i>Value Added Courses (Optional) – Honours / Minor</i>									<b>15</b>
<b>Total Credits</b>									<b>178</b>

SEMESTER I						
Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL10A	Linear Algebra and Calculus	3-1-0-0	4	4
B	BSC	23PYL10A	Engineering Physics	3-1-0-0	4	4
D	ESC	23ESB10D	Programming in C	2-1-2-0	5	4
E	ESC	23ESL10D/ 23ESL10E	Basics of Electrical Engineering Basics of Electronics Engineering	2-0-0-0 2-0-0-0	4	4
G	MNC	23NCL10A	Environmental Science	2-0-0-0	2	--
S	BSC	23PYP10A	Engineering Physics Lab	0-0-2-0	2	1
T	ESC	23ESP10B	Electrical and Electronics Workshop	0-0-2-0	2	1
<b>TOTAL</b>					<b>23</b>	<b>18</b>

SEMESTER II						
Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL10B	Vector calculus, Differential Equations and Transforms	3-1-0-0	4	4
B	BSC	23CYL10A	Engineering Chemistry	3-1-0-0	4	4
C	ESC	23ESB10A	Engineering Graphics	2-0-2-0	4	3
D	ESC	23ESL10G	Digital Electronics	3-0-0-0	3	3
F	ESC	23ESB10F	Python programming	2-0-2-0	4	3
G	MNC	23NCJ10B	Professional Communication	2-0-0-2	4	-
S	BSC	23CYP10A	Engineering Chemistry Lab	0-0-2-0	2	1
T	ESC	23ESB10C	Manufacturing and Construction Practices B	1-0-2-0	3	2
<b>TOTAL</b>					<b>28</b>	<b>20</b>

**SEMESTER III**

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL20A	Discrete Mathematical Structures	3-1-0-0	4	4
B	PCC	23CSL20A	Data Structures	3-1-0-0	4	4
C	PCC	23CSL20B	Computer Organization and Architecture	3-1-0-0	4	4
D	PCC	23CSB20C	Object Oriented Programming Concepts	3-0-2-0	5	4
E	ESC	23ESL00A	Design and Engineering	2-0-0-0	2	2
G	MNC	23NCL20A	Professional Ethics	2-0-0-0	2	---
S	PCC	23CSP20A	Hardware Lab	0-0-3-0	3	2
T	PCC	23CSP20B	Data Structures Lab	0-0-3-0	3	2
R/M	VAC		Remedial/Minor Course	3-0-0-0	3	3
TOTAL					27/30	22/25

**SEMESTER IV**

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	BSC	23MAL20B	Probability Statistics and Numerical Methods	3-1-0-0	4	4
B	PCC	23CSL20D	Operating Systems	3-1-0-0	4	4
C	PCC	23CSL20E	Database Management Systems	3-1-0-0	4	4
D	PCC	23CSL20F	Formal Languages and Automata Theory	3-1-0-0	4	4
E	HSC	23HSL20A	Universal Human Values- II	3-0-0-0	3	3
G	MNC	23NCL20B	Industrial Safety Engineering	2-1-0-0	3	---
S	PCC	23CSP20C	Operating Systems Lab	0-0-3-0	3	2
T	PCC	23CSP20D	DB Lab	0-0-3-0	3	2
R/M/ H	VAC		Remedial/Minor/Honours Course	3-0-0-0	3	3
TOTAL					28/31	23/26

**SEMESTER V**

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PCC	23CSL30A	Computer Networks	3-1-0-0	4	4
B	PCC	23CSL30B	Microprocessors and Microcontrollers	3-1-0-0	4	4
C	PCC	23CSJ30C	Web Technology	2-0-2-1	5	4
D	HSC	23HSL00A	Business Economics and Accountancy	3-0-0-0	3	3
E	PEC	23CSL31X	Programme Elective Course 1	2-1-0-0	3	3
S	PCC	23CSP30A	Microprocessor Lab	0-0-3-0	3	2
T	PCC	23CSP30B	Network Lab	0-0-3-0	3	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-0-0-0	3	3
TOTAL					25/28	22/25

**SEMESTER VI**

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PCC	23CSL30D	Algorithm Analysis and Design	3-1-0-0	4	4
B	PCC	23CSL30E	Artificial Intelligence	3-1-0-0	4	4
C	PCC	23CSB30F	Software Engineering Theory and Practices	3-0-2-0	5	4
D	PEC	23CSL32X	Programme Elective Course 2	2-1-0-0	3	3
E	IEC	23IEL31X	Institute Elective 1	3-0-0-0	3	3
S	PWS	23CSS38A	Seminar	0-0-4-0	4	2
T	PWS	23CSJ38A	Miniproject	0-0-4-0	4	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-0-0-0	3	3
TOTAL					27/30	22/25

SEMESTER VII						
Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PCC	23CSB40A	Cyber Security	3-1-2-0	6	5
B	PCC	23CSB40B	Machine Learning Techniques	2-1-2-0	5	4
C	PEC	23CSL43X	Programme Elective Course 3	2-1-0-0	3	3
E	IEC	23IEL42X	Institute Elective 2	2-1-0-0	3	3
S	PWS	23CSV48A	Comprehensive Course Viva	0-0-2-0	2	1
T	PWS	23CSJ48B	Project Phase I	0-0-4-0	4	2
R/M/H	VAC		Remedial/Minor/Honours Course	0-0-6-0/ 3-0-0-0	6/3	3
TOTAL					23/ (29/26)	18/21

SEMESTER VIII						
Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PEC	23CSL44X	Programme Elective Course 4	2-1-0-0	3	3
B	PEC	23CSL45X	Programme Elective Course 5	2-1-0-0	3	3
C	PEC	23CSL46X	Programme Elective Course 6	2-1-0-0	3	3
U	PWS	23CSJ48C	Project Phase II/Internship	0-0-12-0	12	6
R/M/H	VAC		Remedial/Minor/Honours Course	0-0-6-0	6	3
TOTAL					21/27	15/18

**PROGRAMME ELECTIVE I**

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
E	PEC	23CSL31A	Foundations of Machine Learning	2-1-0-0	3	3
		23CSL31B	Data Analytics	2-1-0-0	3	3
		23CSL31C	Foundations of Security in Computing	2-1-0-0	3	3
		23CSL31D	Automated Verification	2-1-0-0	3	3
		23CSL31E	Introduction to IA32 Architecture	2-1-0-0	3	3
		23CSL31F	Advanced Data Communication	2-1-0-0	3	3

**PROGRAMME ELECTIVE II**

Slot	Category Code	Course Number	Course	L-T-P-J	Hours	Credit
D	PEC	23CSL32A	Cloud Computing	2-1-0-0	3	3
		23CSL32B	Security in Computing	2-1-0-0	3	3
		23CSL32C	Model Based Software Development	2-1-0-0	3	3
		23CSL32D	Natural Language Processing	2-1-0-0	3	3
		23CSL32E	Advanced Topics in IA32 Architecture	2-1-0-0	3	3

**PROGRAMME ELECTIVE III**

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
C	PEC	23CSL43A	Deep Learning	2-1-0-0	3	3
		23CSL43B	Programming Paradigms	2-1-0-0	3	3
		23CSL43C	Cryptography	2-1-0-0	3	3
		23CSL43D	Soft Computing	2-1-0-0	3	3
		23CSL43E	Fuzzy Set Theory and Application	2-1-0-0	3	3
		23CSL43F	Embedded Systems	2-1-0-0	3	3
		23CSL43G	Computer Vision	2-1-0-0	3	3
		23CSL43H	Complexity Theory	2-1-0-0	3	3



**PROGRAMME ELECTIVE IV**

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
A	PEC	23CSL44A	Formal Methods and Tools in Software Engineering	2-1-0-0	3	3
		23CSL44B	Client Server Architecture	2-1-0-0	3	3
		23CSL44C	Parallel Computing	2-1-0-0	3	3
		23CSL44D	Data Compression Techniques	2-1-0-0	3	3
		23CSL44E	Unified Extended Firmware Interface	2-1-0-0	3	3
		23CSL44F	Data Mining	2-1-0-0	3	3
		23CSL44G	Mobile Computing	2-1-0-0	3	3

**PROGRAMME ELECTIVE V**

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
B	PEC	23CSL45A	High Performance Computing	2-1-0-0	3	3
		23CSL45B	Blockchain Technologies	2-1-0-0	3	3
		23CSL45C	Image Processing Technique	2-1-0-0	3	3
		23CSL45D	Internet of Things	2-1-0-0	3	3
		23CSL45E	Software Testing	2-1-0-0	3	3
		23CSL45F	Bioinformatics	2-1-0-0	3	3
		23CSL45G	Computational Linguistics	2-1-0-0	3	3

**PROGRAMME ELECTIVE VI**

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
C	PEC	23CSL46A	Data Centre Networking	2-1-0-0	3	3
		23CSL46B	Network performance optimization	2-1-0-0	3	3
		23CSL46C	Software Defined Networking	2-1-0-0	3	3
		23CSL46D	Data and Visual analytics in AI	2-1-0-0-0	3	3
		23CSL46E	Social Network Analysis	2-1-0-0	3	3

		23CSL46F	Approximation Algorithms	2-1-0-0	3	3
		23CSL46G	Secure Mobile & IoT Systems	2-1-0-0	3	3

**INSTITUTE ELECTIVE**

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
C	IEC	23IEL31A	Introduction to Mobile Computing	2-1-0-0	3	3
		23IEL31B	Data Structures	2-1-0-0	3	3
		23IEL31C	Image Processing Techniques	2-1-0-0	3	3

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
C	IEC	23IEL32A	Introduction to cloud Computing	2-1-0-0	3	3
		23IEL32B	Introduction to Cyber Security	2-1-0-0	3	3
		23IEL32C	Computer Vision	2-1-0-0	3	3

DRAFT

**MINOR**

Semester	BASKET I Specialization: SOFTWARE ENGINEERING				BASKET II Specialization: MACHINE LEARNING				BASKET III Specialization: NETWORKING			
	Course Number	Course	L-T-P-J	Credit	Course Number	Course	L-T-P-J	Credit	Course Number	Course	L-T-P-J	Credit
<b>S3</b>	23CSL2 MA	Object Oriented Programming	3-0-0-0	3	23CSL2 MB	Mathematics for Machine Learning	3-0-0-0	3	23CSL2 MC	Data Communication	3-0-0-0	3
<b>S4</b>	23CSL2 MD	Programming Methodologies	3-0-0-0	3	23CSL2 ME	Concepts in Machine Learning	3-0-0-0	3	23CSL2 MF	Introduction to Computer Networks	3-0-0-0	3
<b>S5</b>	23CSL3 MA	Concepts in Software Engineering	3-0-0-0	3	23CSL3 MB	Concepts in Deep Learning	3-0-0-0	3	23CSL3 MC	Client Server Systems	3-0-0-0	3
<b>S6</b>	23CSL3 MD	Introduction to Software Testing	3-0-0-0	3	23CSL3 ME	Reinforcement Learning	3-0-0-0	3	23CSL3 MF	Wireless Networks and IoT Applications	3-0-0-0	3
<b>S7</b>	23CSJ4 MA	Mini Project	0-0-6-0	3	23CSJ4 MA	Mini Project	0-0-6-0	3	23CSJ4 MA	Mini Project	0-0-6-0	3
<b>S8</b>	23CSJ4 MB	Mini Project	0-0-6-0	3	23CSJ4 MB	Mini Project	0-0-6-0	3	23CSJ4 MB	Mini Project	0-0-6-0	3

## HONOURS

Semester	BASKET I Specialization: SECURITY IN COMPUTING				BASKET II Specialization: MACHINE LEARNING				BASKET III Specialization: FORMAL METHODS			
	Course Number	Course	L-T-P	Credit	Course Number	Course	L-T-P	Credit	Course Number	Course	L-T-P	Credit
S4	23CSL2 HA	Number Theory	3-0-0-0	3	23CSL2HB	Computational Fundamentals of Machine Learning	3-0-0-0	3	23CSL2HC	Principles of Program Analysis and Verification	3-0-0-0	3
S5	23CSL3 HA	Cryptographic Algorithms	3-0-0-0	3	23CSL3HB	Neural Networks and Deep Learning	3-0-0-0	3	23CSL3HC	Principles of Model Checking	3-0-0-0	3
S6	23CSL3 HD	Network Security	3-0-0-0	3	23CSL3HE	Advanced Topics in Machine Learning	3-0-0-0	3	23CSL3HF	Theory of Computability and Complexity	3-0-0-0	3
S7	23CSL4 HA	Cyber Forensics	3-0-0-0	3	23CSL4HB	Advanced Topics in Artificial Intelligence	3-0-0-0	3	23CSL4HC	Logic for Computer Science	3-0-0-0	3
S8	23CSJ4 HA	Mini Project	0-0-6-0	3	23CSJ4HA	Mini Project	0-0-6-0	3	23CSJ4HA	Mini Project	0-0-6-0	3

<b>Theory</b>		Se m	Credit
1.	Data Structures	S3	4
2.	Computer Organization and Architecture	S3	4
3.	Object Oriented Programming	S3	4
4.	Operating Systems	S4	4
5.	Database Management Systems	S4	4
6.	Formal Languages and Automata Theory	S4	4
7.	Computer Networks	S5	4
8.	Microprocessors and Microcontrollers	S5	4
9.	Artificial Intelligence	S5	4
10.	Algorithm Analysis and Design	S6	4
11.	Machine Learning	S6	4
12.	Software Engineering Theory and Practices	S6	4
13.	Web Technology	S5	4
14.	Cyber Security	S7	5
Total			57

<b>Labs</b>			
	Data Structures	S3	2
	Hardware Lab	S3	2
	Db Lab	S4	2
	Operating Systems Lab	S4	2
	Microprocessor Lab	S5	2
	Network Lab	S5	2
Total			12

<b>PWS</b>			
	Seminar	S6	2
	Miniproject/Internship	S6	2
	Comprehensive	S7	1
	Project Phase1	S7	3
	Project Phase2	S8	5
Total			13

<b>ESC</b>			
	Comp Programming	S1	4
	Python Programming	S2	4
	Graphics	S2	3
	BEC & BEE	S1	4
	Digital Electronics	S2	3
	Design and Engineering	S3	2
	Man.Practices	S1	1
	E and E Workshop	S2	1
Total			22

<b>BSC</b>			
	Calculus and Linear Algebra	S1	4
	Engineering Physics A	S1	5
	Differential Equations and Transforms	S2	4
	Engineering Chemistry	S2	5
	Discrete Mathematical Structures	S3	4
	Probability Statistics and Numerical Methods	S4	4
Total			26

<b>MNC</b>			
	Life Skills and Professional Ethics	S1	0
	Professional Communication	S2	0
	Environmental Science	S3	0
	Industrial Safety Engineering	S4	0
Total			

<b>HSC</b>			
	UHV-II		3
	Business Economics and Accountancy		3
Total			6