



Mar Baselios College of Engineering and Technology

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

**B.TECH
Computer Science and Engineering (AI)**



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

(Artificial Intelligence)

2023 SCHEME

(AUTONOMOUS)



MAR BASELIOS COLLEGE OF ENGINEERING AND TECHNOLOGY

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

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(Artificial Intelligence)

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	AICTE	2022	2023
1	Humanities and Social Sciences including Management Courses	HSC	15	5	6
2	Basic Science Courses	BSC	23	26	26
3	Engineering Science Courses	ESC	22	22	22
4	Programme Core Courses, Comprehensive Course Work and Viva Voce	PCC	54	79	69
5	Programme Elective Courses	PEC	18	15	18
6	Open Elective Courses	OEC	15	3	6
7	Project Work and Seminar	PWS	16	10	13
8	Mandatory Non-credit Courses (P/F) with Grade	MNC	---	---	--
9	Mandatory Student Activities (P/F)	MSA	3	2	3
Total Mandatory Credits			163	162	163
Value Added Courses (Optional) – Honours/Minor			15	15	15

ii) Semester-wise Credit Distribution

Semester	I	II	III	IV	V	VI	VII	VIII	Total Credits
Credits for Courses	18	20	22	23	21	25	16	15	160
	38		45		46		31		160

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	0
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
TOTAL					23	18

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	23ESB10H	Python Programming	2-0-2-0	4	3
G	MNC	23NCJ10B	Professional Communication	2-0-0-2	4	0
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
TOTAL					28	20

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	23CTB20C	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	Mathematics for Artificial Intelligence	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	Database 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

Introduction to AI

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	23CTL30A	Introduction to Artificial Intelligence	3-0-0-0	3	3
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	23CTL31X	Programme Elective I	2-1-0-0	3	3
S	PCC	23CTP30A	Artificial Intelligence 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					24/28	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	23CTJ30B	Machine Learning	2-0-2-1	5	4
C	PCC	23CSB30F	Software Engineering Theory and Practices	3-0-2-0	5	4
D	PEC	23CTL32X	Programme Elective II	2-1-0-0	3	3
E	IEC	23IEL31X	Institute Elective 1	3-0-0-0	3	3
F	PCC	23CTB30D	Big Data Analytics	2-0-2-0	4	3
S	PWS	23CTS38A	Seminar	0-0-4-0	4	2
T	PWS	23CTJ38B	Miniproject	0-0-4-0	4	2
R/M/H	VAC		Remedial/Minor/Honours Course	3-0-0-0	3	3
TOTAL					32/35	22/25

SEMESTER VII						
Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PCC	23CTL40A	Robotics and Intelligent systems	3-0-0-0	3	3
B	PCC	23CTL40B	Deep Learning	3-0-0-0	3	3
C	PEC	23CTL43X	Programme Elective III /Industry Elective 1	2-1-0-0	3	3
E	IEC	23IEL42X	Institute Elective 2	2-1-0-0	3	3
F	PCC	23CTP40A	Robotics Lab	0-0-2-0	2	1
S	PWS	23CTV48A	Comprehensive Course Viva	0-0-2-0	2	1
T	PWS	23CTJ48A	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					20 26/23	16/21

SEMESTER VIII						
Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PEC	23CTL44X	Programme Elective IV	2-1-0-0	3	3
B	PEC	23CTL45X	Programme Elective V	2-1-0-0	3	3
C	PEC	23CTL46X	Programme Elective VI	2-1-0-0	3	3
S	PWS	23CTJ48B	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	Hours	Credit
E	PEC	23CTL31A	Natural Language Processing	2-1-0	3	3
		23CTL31B	Concepts in computer graphics and image processing	2-1-0	3	3
		23CTL31C	Intelligent Model Design and Thinking	2-1-0	3	3
		23CTL31D	Social Network Analysis	2-1-0	3	3
		23CTL31E	Data Mining	2-1-0	3	3
		23CTL31F	Foundations of security in computing	2-1-0	3	3

PROGRAMME ELECTIVE II

Slot	Category Code	Course Number	Courses	L-T-P	Hours	Credit
D	PEC	23CTL32A	Computational Linguistics	2-1-0	3	3
		23CTL32B	Image and Video Analytics	2-1-0	3	3
		23CTL32C	AI Ethics and Responsible AI	2-1-0	3	3
		23CTL32D	Web Intelligence and Big Data	2-1-0	3	3
		23CTL32E	Intrusion Detection and Prevention Systems	2-1-0	3	3
		23CTL32F	Time Series Analysis	2-1-0	3	3
		23CTL32G	AI For Cyber Security	2-1-0	3	3

PROGRAMME ELECTIVE III

Slot	Category Code	Course Number	Course	L-T-P-J	Hours	Credit
C	PEC	23CTL43A	Full Stack Development	2-1-0-0	3	3
		23CTL43B	Computer Vision	2-1-0-0	3	3
		23CTL43C	Artificial Neural Networks	2-1-0-0	3	3
		23CTL43D	Data Pre-processing and Feature Engineering	2-1-0-0	3	3
		23CTL43E	IoT for AI	2-1-0-0	3	3
		23CTL43F	Human Computer Interaction	2-1-0-0	3	3

PROGRAMME ELECTIVE IV

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
A	PEC	23CTL44A	Deep Learning for Signal & Image Processing	2-1-0-0	3	3
		23CTL44B	Data and Visual analytics in AI	2-1-0-0	3	3
		23CTL44C	Knowledge Engineering and Expert Systems	2-1-0-0	3	3
		23CTL44D	Cybercrime Forensics and Digital Forensics	2-1-0-0	3	3
		23CTL44E	Artificial Intelligence for Robotics	2-1-0-0	3	3

PROGRAMME ELECTIVE V

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
B	PEC	23CTL45A	High Performance Computing	2-1-0-0	3	3
		23CTL45B	AI for Health Care	2-1-0-0	3	3
		23CTL45C	Big Data and Database Management	2-1-0-0	3	3
		23CTL45D	Cognitive Modelling	2-1-0-0	3	3

PROGRAMME ELECTIVE VI

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
C	PEC	23CTL46A	Data Compression Techniques	2-1-0-0	3	3
		23CTL46B	Game Theory in Artificial Intelligence	2-0-0-0	3	3
		23CTL46C	Machine Learning models and Storage Management	2-1-0-0	3	3
		23CTL46D	Applied Cryptography	2-1-0-0	3	3
		23CTL46E	Bio-Inspired Optimization Techniques	2-1-0-0	3	3

INSTITUTE ELECTIVE

Slot	Category Code	Course Number	Courses	L-T-P-J	Hours	Credit
C	IEC	23IEL31A	Big Data Analytics	2-1-0-0	3	3
		23IEL31B	Introduction to AI and ML	2-1-0-0	3	3
		23IEL31C	Web Technology	2-1-0-0	3	3
		23IEL31D	Data Science	2-1-0-0	3	3
		23IEL31E	Natural Language Processing	2-1-0-0	3	3

MINOR

Semester	BUCKET I Specialization: Data Science				BUCKET II Specialization: MACHINE LEARNING			
	Course Number	Course	L-T-P-J	Credit	Course Number	Course	L-T-P-J	Credit
S3	23CTL2MA	Statistical Machine Learning	3-0-0-0	3	23CTL2MB	Intrusion Detection and Prevention System	3-0-0-0	3
S4	23CTL2MC	Data Visualization & Presentation	3-0-0-0	3	23CTL2MD	Cyber Security	3-0-0-0	3
S5	23CTL3MA	Time Series Analysis & Forecasting	3-0-0-0	3	23CTL3MB	Introduction to Blockchain technologies	3-0-0-0	3
S6	23CTL3MC	Social Network Analysis	3-0-0-0	3	23CTL3MD	Privacy and security in IoT	3-0-0-0	3
S7	23CTJ4MA	Mini Project	0-0-6-0	3	23CTJ4MA	Mini Project	0-0-6-0	3
S8	23CTJ4MB	Mini Project	0-0-6-0	3	23CTJ4MB	Mini Project	0-0-6-0	3

HONOURS

Semester	BUCKET I Specialization: SECURITY IN COMPUTING				BUCKET II Specialization: COMPUTATIONAL BIOLOGY				BUCKET III Specialization: COMPUTER VISION			
	Course Number	Course	L-T-P-J	Credit	Course Number	Course	L-T-P-J	Credit	Course Number	Course	L-T-P-J	Credit
S4	23CSL2HA	Number Theory	3-1-0-0	3	23CTL2HA	Computational Fundamentals for Bioinformatics	3-0-0-0	3	23CTL2HB	Advanced Topics in Computer Graphics	3-0-0-0	3
S5	23CSL3HA	Cryptographic Algorithms	3-0-0-0	3	23CTL3HA	Computational Biology	3-0-0-0	3	23CTL3HB	Advanced Concepts In Computer Vision	3-0-0-0	3
S6	23CSL3HD	Network Security	3-0-0-0	3	23CTL3HC	Machine Learning in Computational Biology	3-0-0-0	3	23CTL3HD	Image And Video Processing	3-0-0-0	3
S7	23CSL4HA	Cyber Forensics	3-0-0-0	3	23CTL4HA	Computational Health Informatics	3-0-0-0	3	23CTL4HB	Surveillance Video Analytics	3-0-0-0	3
S8	23CTJ4HA	Mini Project	0-0-6-0	3	23CTJ4HA	Mini Project	0-0-6-0	3	23CTJ4HA	Mini Project	0-0-6-0	3