

# M. Tech - 2024

Discipline: Computer Science and Engineering

# M. Tech Curriculum, 2024

	M Tech COURSE STRUCTURE						
Semester	Course work content	Total credits allotted	Credit allotted semester wise				
	Core courses: 3 nos	3x3 = 9					
	Programme electives: 2 nos	2x3 = 6					
Ι	Laboratory: 1 no	1x1 = 1	18				
	Research Methodology & IPR: 1 no	1x2 =2					
	Core courses: 2 nos	2x3 = 6					
п	Programme electives: 3 nos	3x3 = 9	18				
	Laboratory: 1 no	1x1 = 1					
	Min project: 1 no	1x2 =2					
	MOOC: 1 nos	1x2= 2					
	Internship:1 no	1x3 =3					
III	Audit course: 1 nos	No Credit	16				
	Dissertation/Research Project: 1 no	1x11 = 11					
IV	Phase 2: Dissertation/Research Project: 1 no	1x16=16	16				
	TOTAL	IPEN	68				

SL	COURSE	COURSE MARKS		RKS	ІТР	HOU	CRE
OT	CODE	COURSE	CIE	ESE	L-1-f	RS	DIT
А	241TCS100	ADVANCED MACHINE LEARNING	40	60	3-0-0	3	3
В	241TCS001	ADVANCED DATABASE MANAGEMENT	40	60	3-0-0	3	3
С	241TCS002	FOUNDATIONS OF COMPUTER SCIENCE	40	60	3-0-0	3	3
D	241ECSXXX	PROGRAM ELECTIVE 1	40	60	3-0-0	3	3
Е	241ECSXXX	PROGRAM ELECTIVE 2	40	60	3-0-0	3	3
S	241RGE100	RESEARCH METHODOLOGY AND IPR	40	60	2-0-0	2	2
Т	241LCS100	COMPUTING LAB I	100	-	0-0-2	2	1
		Total	340	360		19	18
Teach	ing Assistance: 6	hour		5	Z		

	PROGRAM ELECTIVES - SEMESTER 1					
SLOT	SL NO	COURSE CODE	COURSE NAME	L-T-P	HOURS	CREDIT
	1	241ECS100	OBJECT ORIENTE <mark>D</mark> SOFTWARE ENGINEERING	3-0-0	3	3
	2	241ECS001	ADVANCED DATA MINING	3-0-0	3	3
	3	241ECS002	CLOUD COMPUTING	3-0-0	3	3
	4	241ECS003	WEB SERVICES	3-0-0	3	3
	5	241ECS004	COMPUTATIONAL INTELLIGENCE	3-0-0	3	3
D/E	6	241ECS005	AUTOMATED VERIFICATION	3-0-0	3	3
	7	241ECS006	ADVANCED COMPUTER NETWORKS	3-0-0	3	3
	8	241ECS007	PATTERN RECOGNITION	3-0-0	3	3
	9	241ECS008	ADVANCED COMPUTER ARCHITECTURE	3-0-0	3	3
	10	241ECS009	NATURAL LANGUAGE PROCESSING AND TEXT	3-0-0	3	3

Vimal Jyothi Engineering College

		MINING			
11	241ECS010	ADVANCED COMPILER DESIGN	3-0-0	3	3
12	241ECS011	BIOINFORMATICS	3-0-0	3	3

# Semester 2

SL	COURSE	COURSE NAME	MARKS		L-T-P	HOURS	CRE
OT	CODE		CIE	ESE			DIT
А	242700100	ADVANCED DATA	40	60	3-0-0	3	3
	2421C8100	ALGORITHMS	5				
В	242TCS001	ADVANCED OPERATING SYSTEMS	40	60	3-0-0	3	3
С	242ECSXXX	PROGRAM ELECTIVE 3	40	60	3-0-0	3	3
D	242ECSXXX	PROGRAM ELECTIVE 4	40	60	3-0-0	3	3
Е	242ECSXXX	PROGRAM ELECTIVE 5	40	60	3-0-0	3	3
S	242PCS100	<mark>M</mark> INI PROJECT	100	-	0- <mark>0-</mark> 4	4	2
Т	242LCS100	COMPUTING LAB 2	100	-	0-0-2	2	1
		Total	400	300		21	18
Teach	ing Assistance:	6 hours	- >				

	PROGRAM ELECTIVES - SEMESTER II					
SLOT	SL NO	COURSE CODE	COURSE NAME	L-T-P	HOUR S	CREDI T
	1	242ECS100	BIG DATA ANALYTICS	3-0-0	3	3
	2	242ECS001	WIRELESS SENSOR NETWORKS	3-0-0	3	3
	3	242ECS002	DEEP LEARNING	3-0-0	3	3
	4	242ECS003	COMPUTER VISION	3-0-0	3	3
	5	242ECS004	SEMANTIC WEB ARCHITECTURE	3-0-0	3	3
	6	242ECS005	PROGRAM ANALYSIS	3-0-0	3	3

	7	242ECS006	BLOCKCHAIN TECHNOLOGY AND IOT	3-0-0	3	3
	8	242ECS007	SOCIAL NETWORK ANALYSIS	3-0-0	3	3
	9	242ECS008	MODERN DATABASE MANAGEMENT	3-0-0	3	3
C/D/E	10	242ECS009	DISTRIBUTED ALGORITHMS	3-0-0	3	3
	11	242ECS010	CYBER FORENSICS AND INFORMATION SECURITY	3-0-0	3	3
	12	242ECS011	SOFTWARE TESTING	3-0-0	3	3
	13	242ECS012	PYTHON FOR MACHINE LEARNING	3-0-0	3	3
	14	242ECS013	DEEP LEARNING FOR COMPUTER VISION	3-0-0	3	3
	15	242ECS014	STATISTICAL MACHINE LEARNING	3-0-0	3	3
	16	242ECS015	PRINCIPLES OF DATA SCIENCE	3-0-0	3	3
Semester	3					

# Semester 3

SL		COURSE	MARKS		L-T-P	HOURS	CREDIT
ΟΤ	COURSE CODE	NAME	CIE	ESE			
A*	243MCSXXX	MOOC	To be comp successfull	pleted y	GE		2
В	243AGEXXX	AUDIT COURSE	To be comp successfull	oleted y	3-0-0	3	
С	243ICS100	INTERNSHIP	100 MP1	R			3
D	243PCS100	DISSERTATIO N PHASE 1	100	-	0-0-17	17	11
		Total	200			20	16

# **Teaching Assistance: 6 hours**

\*MOOC Course to be successfully completed before the commencement of fourth semester (starting from semester 1).

AUDIT COURSE						
SLO T	SL NO	COURSE CODE	COURSE NAME	L-T- P	HOURS	CREDIT
	1	243AGE101	ACADEMIC WRITING	3-0-0	3	-
	2	243AGE002	ADVANCED ENGINEERING MATERIALS	3-0-0	3	-
	3	243AGE003	FORENSIC ENGINEERING	3-0-0	3	-
	4	243AGE0034	DATA SCIENCE FOR ENGINEERS	3-0-0	3	-
	5	243AGE005	DESIGN THINKING	3-0-0	3	-
_	6	243AGE006	FUNCTIONAL PROGRAMMING IN HASKELL	3-0-0	3	-
В	7	243AGE007	FRENCH LANGUAGE (A1 LEVEL)	Y		-
	8	243AGE008	GERMAN LANGUAGE (A1 LEVEL)	Cortif	ionto to ho	-
	9	243AGE009	JAPANESE LANGUAGE (N5 LEVEL)	sul	omitted	-
	10	243AGE010	IELTS (Minimum score of 6.5, with at least 5.5 in each individual section of the test)			-

# Semester 4

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Sem	ester 4	Vinner		THI			
SL	COURSE	COURSE NAME	MARK	KS	L-T-P	HOURS	CREDIT
OT	CODE		CIE	ESE			
A	244PCS100	Dissertation Phase II	100	100	0-0-24	24	16
		Total	100	100		24	16

**Teaching Assistance: 5 hours** 

#### ASSESSMENT PATTERN

## (i) CORE COURSES

Evaluation shall only be based on application, analysis or design-based questions (for both internal and end semester examinations).

## Continuous Internal Evaluation : 40 marks

Micro project/Course based project

Course based task/Seminar/Quiz Test paper, 1 no : 10 marks : 10 marks

: 20 marks

The project shall be done individually. Group projects not permitted. Test paper shall include minimum 80% of the syllabus.

## (ii) ELECTIVE COURSES

Evaluation shall only be based on application, analysis or design-based questions (for both internal and end semester examinations)

Continuous Internal Evaluation: 40 marks	
Preparing a review article based on peer reviewed original	
publications (minimum 10 publications shall be referred)	: 15 marks
Course based task/Seminar/Data collection and interpretation	: 15 marks
Test paper, 1 no	: 10 marks
Test paper shall include minimum 80% of the syllabus.	

#### End Semester Examination Theory paper: 60 marks

The end semester examination will be conducted as per exam Calendar of VJEC (Autonomous). There will be two parts; Part A and Part B. Part A contain 8 numerical questions (such questions shall be useful in the testing of knowledge, skills, comprehension, application, analysis, synthesis, evaluation and understanding of the students), with 1 question from each module, having 4 marks for each question. Students shall answer all questions. Part B contains 7 questions (such questions shall be useful in the testing of overall achievement and maturity of the students in a course, through long answer questions relating to theoretical/practical knowledge, derivations, problem solving and quantitative evaluation), with minimum one question from each module of which student shall answer any four. Each question can carry 7 marks. Total duration of the examination will be 150 minutes.

#### (iii) RESEARCH METHODOLOGY & IPR

#### **Continuous Internal Evaluation** : 40 marks

Course based task	: 15 marks
Seminar/Quiz	: 15 marks
Test paper, 1 no	: 10 marks
Test paper shall include minimum 8	0% of the syllabus.
End Semester Examination	: 60 marks

The end semester examination will be conducted as per exam Calendar of VJEC (Autonomous). The examination will be for 150 minutes and contain two parts; Part A and Part B. Part A will contain 6 short answer questions with 1 question each from modules 1 to 4, and 2 questions from module 5. Each question carries 5 marks. Part B will contain only 1 question based on a research article from the respective discipline and carries 30 marks. The students are to answer the questions based on that research article.

## (iv) AUDIT COURSE

Continuous Internal Evaluation: 40 marks

Course based task : 15 marks

Seminar/Quiz : 15 marks

Test paper, 1 no. : 10 marks

Test paper shall include minimum 80% of the syllabus.

End Semester Examination: 60 marks

The examination will be conducted by the College. The examination will be for 150 minutes and will contain 7 questions, with minimum one question from each module of which student should answer any five. Each question can carry 12 marks.

## (v) LABORATORY COURSES

The laboratory courses will be having only Continuous Internal Evaluation and carries 100 marks. Final assessment shall be done by two examiners; one examiner will be a senior faculty from the same department.

## (vi) MOOC COURSES

The MOOC course shall be considered only if it is conducted by the agencies namely AICTE/NPTEL/SWAYAM or NITTTR. The MOOC course should have a minimum duration of 6 weeks and the content of the syllabus shall be enough for at least 40 hours of teaching. The course should have a proctored/offline end semester examination. The students can do the MOOC according to their convenience from the beginning of first semester, but shall complete it by third semester. The list of MOOC courses will be approved by the college if at least 70% of the course content match with the area/stream of study. The course shall not be considered if its content has more than 50% of overlap with a core/elective course in the concerned discipline or with an open elective.

MOOC Course to be successfully completed before the commencement of fourth semester (starting from semester 1). A credit of 2 will be awarded to all students whoever successfully completes the MOOC course as per the evaluation pattern of the respective agency conducting the MOOC.

#### (vii) MINIPROJECT

#### Total marks: 100, only CIA

Mini project can help to strengthen the understanding of student's fundamentals through application of theoretical concepts and to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge. Doing more projects increases problem-solving skills. The introduction of mini projects ensures preparedness of students to undertake dissertation. Students should identify a topic of interest in consultation with PG Programme Coordinator that should lead to their dissertation/research project. Demonstrate the novelty of the project through the results and outputs. The progress of the mini project is evaluated based on three reviews, two interim reviews and a final review. A report is required at the end of the semester.

	28		- / oO.		
Interim evaluation	-	: 40 marks (20 marks for each review),			
final evaluation		: 35 marks			
(will be evaluating	the	level of	completion	and demonstration	of
functionality/specification	s, clarity	of presenta	ation, oral exan	nination, wo <mark>rk knowl</mark>	edge and
involvement)	~ (				-
Report		: 15 marks			
(the committee will be ev	valuating	for the tech	nical content, ad	equacy of references,	templates
followed and permitted pla	agiarism l	evel is not n	nore than 25%)		
Supervisor/Guide		: 10 Marks			

# (viii)TEACHING ASSISTANTSHIP (TA)

All M Tech students irrespective of their category of admission shall undertake TA duties for a minimum duration as per the curriculum. Being a TA, the student will get an excellent opportunity to improve their expertise in the technical content of the course, enhance communication skills, obtain a hands-on experience in handling the experiments in the laboratory and improve peer interactions.

The possible TA responsibilities include the following: facilitate a discussion section or tutorial for a theory/ course, facilitate to assist the students for a laboratory course, serve as a mentor for students, and act as the course web-master. TAs may be required to attend the instructor's lecture regularly. A TA shall not be employed as a substitute instructor, where the effect is to relieve the instructor of his or her teaching responsibilities.

For the tutorial session:

(i) Meet the teacher and understand your responsibilities well in advance, attend the lectures of the course for which you are a tutor, work out the solutions for all the tutorial problems yourself, approach the teacher if you find any discrepancy or if you need help in solving the tutorial problems, use reference text books, be innovative and express everything in English only.

(ii) Try to lead the students to the correct solutions by providing appropriate hints rather than solving the entire problem yourself, encourage questions from the students, lead the group to a discussion based on their questions, plan to ask them some questions be friendly and open with the students, simultaneously being firm with them.

(iii) Keep track of the progress of each student in your group, give periodic feedback to the student about his/her progress, issue warnings if the student is consistently under-performing, report to the faculty if you find that a particular student is consistently underperforming, pay special attention to slow-learners and be open to the feedback and comments from the students and faculty.

(iv) After the tutorial session you may be required to grade the tutorials/assignments/tests. Make sure that you work out the solutions to the questions yourself. and compare it with the answer key, think and work out possible alternate solutions to the same question, understand the marking scheme from the teacher. Consult the teacher if are and make sure that you are not partial to some student/students while grading. Follow basic ethics. Handling a laboratory Session:

(i) Meet the faculty – in- charge a few days in advance of the actual lab class and get the details of the experiment, get clarifications from him/her regarding all aspects of the experiment and the expectations, prepare by reading about the theoretical background of the experiment, know the physical concepts involved in the experiment, go to the laboratory and check out the condition of the equipment/instrumentation, perform the laboratory experiment at least once one or two days before the actual laboratory class, familiarize with safety/ security aspects of the experiment / equipment /laboratory, prepare an instruction sheet for the experiment in consultation with the faculty, and keep sufficient copies ready for distribution to students for their reference.

(ii) Verify condition of the equipment/set up about 30 minutes before the students arrive in the class and be ready with the hand outs, make brief introductory remarks about the experiment, its importance, its relevance to the theory they have studied in the class, ask the students suitable questions to know their level of preparation for the experiment, discuss how to interpret results, ask them comment on the results.

(iii) Correct/evaluate/grade the submitted reports after receiving suitable instructions from the faculty in charge, continue to interact with students if they have any clarifications regarding any aspect of the laboratory session, including of course grading, Carefully observe instrument and human safety in laboratory class, Preparing simple questions for short oral quizzing during explanation of experiments enables active participation of students, facilitate attention, provides feedback and formative assessment.

