

**MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**

(A Govt. Aided UGC Autonomous Institute Affiliated to RGPV, Bhopal)

NAAC Accredited with A++ Grade

**Flexible**

**Scheme**

(2021-2025)

**B.Tech.**

in

**Mathematics and Computing**



*Department of Engineering Mathematics and Computing*

**Madhav Institute of Technology & Science**

**Gwalior-474005**

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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## *Mathematics and Computing*

### Abbreviations used

<b>L</b>	<b>Lecture</b>
<b>T</b>	<b>Tutorial</b>
<b>P</b>	<b>Practical</b>
<b>HSMC</b>	<b>Humanities and Social Sciences including Management Courses</b>
<b>BSC</b>	<b>Basic Science Courses</b>
<b>ESC</b>	<b>Engineering Science Courses</b>
<b>DC</b>	<b>Departmental Core</b>
<b>DE</b>	<b>Departmental Elective</b>
<b>OC</b>	<b>Open Category</b>
<b>DLC</b>	<b>Departmental Laboratory Courses</b>
<b>MC</b>	<b>Mandatory Course</b>
<b>MOOC</b>	<b>Massive Open Online Courses</b>

### Definition of Credit:

<b>1 Hr. Lecture (L) per week</b>	<b>1 credit</b>
<b>1 Hr. Tutorial (T) per week</b>	<b>1 credit</b>
<b>2 Hours Practical(Lab)/week</b>	<b>1 credit</b>

*\*\*Minor variation is allowed as per need of the respective disciplines. Please consult the AICTE model curriculum as a standard reference, if needed.*

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## Department of Engineering Mathematics & Computing

### Scheme of Examination

### B. Tech. I Semester

(Admitted batch 2021)

S.No	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Exam	Mode of Teaching
				Theory Slot				Practical Slot				L	T	P			
				End Sem.	Proficiency in subject /course	Mid Sem Exam.	Quiz/ Assignment	End Sem.	Lab work & Sessional	Skill Based Mini Project							
1.	250101	DC	Introduction to Computing	50	10	20	20	-	-	-	100	3	-	-	3	MCQ	Blended (2/1)
2.	250102	DC	Introduction to Computer Programming	50	10	20	20	60	20	20	200	2	1	2	4	A+O	Blended (2/1)
3.	250107	DC	Probability and Random Process	50	10	20	20				100	3	1	-	4	PP	Off line
4.	250104	DC	Element of Calculus	50	10	20	20	-	-	-	100	3	1	-	4	PP	Off line
5.	100015	DC	Energy, Ecology, Environment & Society (EEES)	50	10	20	20	-	-	-	100	3	-	-	3	MCQ	On line
6.	250106	DLC	Computing Lab					60	20	20	100			2	1	SO	Off line
<b>Total</b>				<b>250</b>	<b>50</b>	<b>100</b>	<b>100</b>	<b>120</b>	<b>40</b>	<b>40</b>	<b>700</b>	<b>14</b>	<b>03</b>	<b>02</b>	<b>19</b>	<b>-</b>	

**MCQ:** Multiple Choice Question, **AO:** Assignment + Oral, **OB:** Open Book, **PP:** Pen Paper, **SO:** Submission and Oral

Mode of Teaching						Mode of Examination					Total Credits
Theory				Lab	NEC	Theory			Lab	SIP/ SLP/ NEC	
Offline	Online	Blended		Offline	Interactive	PP	A+O	MCQ	SO	SO	
		Offline	Online								
8	3	4	2	2	-	2	1	2	1	-	19
42%	16%	21%	10.5%	10.5%	-	33.33%	16.66%	33.33%	16.66%	-	Credits %

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## Department of Engineering Mathematics & Computing

### Scheme of Examination

### B. Tech. II Semester

(Admitted batch 2021)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Exam	Mode of Teaching
				End Sem.	Theory Slot			Practical Slot				L	T	P			
					\$Proficiency in subject /course	Mid Sem Exam.	Quiz/ Assignment	End Sem.	Lab work & Sessional	Skill Based Mini Project							
1.	250201	DC	Computer Organization and Logic Design	50	10	20	20	-	-	-	100	2	1	-	3	PP	Blended (2/1)
2.	250202	DC	Differential Equations	50	10	20	20	-	-	-	100	3	1	-	4	PP	Offline
3.	250203	DC	Object Oriented Methodology and Programming with C++	50	10	20	20	60	20	20	200	2	1	2	4	A+O	Blended (3/1)
4.	250100	BSC	Linear Algebra	50	10	20	20	-	-	-	100	3	1	-	4	PP	Offline
5.	100016	HSMC	Technical Language	50	10	20	20				100	2	1	-	3	MCQ	Blended (2/1)
6.	100017	HSMC	Language Lab.					60	20	20	100			2	1	SO	Offline
<b>Total</b>				<b>250</b>	<b>50</b>	<b>100</b>	<b>100</b>	<b>120</b>	<b>40</b>	<b>40</b>	<b>700</b>	<b>12</b>	<b>05</b>	<b>02</b>	<b>19</b>	<b>-</b>	
<sup>s</sup> Proficiency in course/subject – includes the weight age towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject																	

**MCQ:** Multiple Choice Question , **AO:** Assignment + Oral, **OB:** Open Book, **P:** Pen Paper, **SO:** Sessional and Oral

Mode of Teaching					Mode of Examination					Total Credits	
Theory				Lab	NEC	Theory			Lab		SIP/ SLP/ NEC
Offline	Online	Blended		Offline	Interactive	PP	A+O	MCQ	SO		SO
		Offline	Online								
<b>8</b>	<b>-</b>	<b>6</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>4</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>-</b>	
<b>44%</b>	<b>-</b>	<b>31.5%</b>	<b>16%</b>	<b>10.5%</b>	<b>-</b>	<b>66.66%</b>	<b>16.66%</b>	<b>-</b>	<b>16.66%</b>	<b>-</b>	
										<b>19</b>	
										<b>Credits %</b>	

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## Department of Engineering Mathematics & Computing

### Scheme of Examination

### B. Tech. III Semester

(Admitted batch 2021)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam.
				Theory Slot				Practical Slot				L	T	P			
				End Sem.		Mid Sem. Exam.	Quiz/Assignment	End Sem	Lab Work & Sessional	Skill Based Mini Project							
				End Term Evaluation	\$ Proficiency in subject/course												
1.	250301	DC	Simulation Modeling and Analysis	50	10	20	20	-	-	-	100	2	1	-	3	Blended (2/1)	MCQ
2.	250309	DC	Discrete Mathematical Structures	50	10	20	20	-	-	-	100	3	1	-	4	Offline(4/0)	PP
3.	250303	DC	Operating System Concepts	50	10	20	20	-	-	-	100	2	1	-	3	Blended (2/1)	PP
4.	250310	DC	Data Structures and Algorithms	50	10	20	20	60	20	20	200	3	-	2	4	Blended (2/1)	PP
5.	250311	DC	Numerical Techniques	50	10	20	20	-	-	-	100	3	1	-	4	Offline (4/0)	PP
6.	250306	DLC	Computing Lab	-	-	-	-	60	20	20	100	-	-	2	1	Offline (2/0)	A+O
7.	250307	DLC	Self-learning/Presentation <sup>#</sup>	-	-	-	-	-	40	-	40	-	-	2	1	Online +Mentoring	SO
8.	200xxx	CLC	Novel Engaging Course	-	-	-	-	50	-	-	50	-	-	2	1	Interactive	SO
9.	250308	DLC	Summer Internship Project-I (Institute Level Evaluation)	-	-	-	-	60	-	-	60	-	-	4	2	Offline	SO
Total				250	50	100	100	230	80	40	850	13	4	6	23		
10.	1000005	MAC	Project Management and Financing	50	10	20	20	-	-	-	100	2	-	-	Grade	Online	MCQ

<sup>\$</sup>Proficiency in course/subject – includes the weight age towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject

<sup>#</sup>compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance, assignments and presentation

Mode of Teaching						Mode of Examination					Total Credits
Theory		Blended	Lab	NEC		Theory			Lab	SIP/ SLP/ NEC	
Offline	Online			Offline	Interactive	PP	A+O	MCQ			
8	-	6	3	5	1	4	1	1	2	1	
34.78%	-	26.09%	13.045%	21.74%	4.34%	44.44%	11.11%	11.11%	22.22%	11.11%	Credits %

MCQ: Multiple Choice Question ,AO: Assignment + Oral, OB: Open Book, PP: Pen Paper, SO: Submission and Oral

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**Department of Engineering Mathematics & Computing**

**Scheme of Examination**

**B. Tech. IV Semester**

(Admitted batch 2021)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted							Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam.
				Theory Slot				Practical Slot				L	T	P			
				End Sem.		Mid Sem. Exam.	Quiz/ Assignment	End Sem	Lab Work & Sessional	Skill Based Mini Project							
				End Term Evaluation	Proficiency in subject /course												
1.	250401	DC	Transform and Vector Calculus	50	10	20	20	-	-	-	100	2	1	-	3	Offline (3/0)	PP
2.	250402	DC	Data Base and Management System & SQL	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	PP
3.	250403	DC	Theory of Computation	50	10	20	20				100	2	1	-	3	Blended (2/1)	MCQ
4.	250404	DC	Design & Analysis of Algorithm	50	10	20	20				100	2	1	-	3	Blended(2/1)	PP
5.	250407	DC	Number Theory and Cryptography	50	10	20	20	-	-	-	100	3	1	-	4	Offline(3/0)	PP
6.	250408	DLC	Programming in Python	-	-	-	-	60	20	20	100	-	-	4	2	Offline	SO
7.	200xxx	CLC	Novel Engaging Course	-	-	-	-	50	-		50	-	-	2	1	Interactive	SO
<b>Total</b>				<b>250</b>	<b>50</b>	<b>100</b>	<b>100</b>	<b>170</b>	<b>40</b>	<b>40</b>	<b>750</b>	<b>11</b>	<b>5</b>	<b>4</b>	<b>20</b>		
<b>Summer Internship Project-II (Soft skills Based) for two weeks duration: Evaluation in V Semester</b>																	
8.	1000001	MAC	Indian Constitution and Traditional Knowledge	50	10	20	20	-	-	-	100	2	-	-	Grade	Online	MCQ

<sup>§</sup>Proficiency in course/subject – includes the weight age towards ability/ skill/ competence /knowledge level /expertise attained /attendance etc. in that particular course/subject

<sup>#</sup>compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance, assignments and presentation

Mode of Teaching				Mode of Examination							Total Credits
Theory		Lab	NEC	Theory			Lab	NEC			
Offline	Online			Blended		PP			A+O	MCQ	
		Offline	Online	SO	SO						
6	2	6	3	2	1	4	-	2	1	1	20
30%	10%	30%	15%	10%	5%	50%	-	25%	12.5%	12.5%	Credits %

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## Department of Engineering Mathematics & Computing

### Scheme of Examination

### B. Tech. V Semester

(Admitted batch 2021)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam.	
				Theory Slot				Practical Slot			L	T	P				
				End Sem.		Continuous Evaluation		End Sem.	Continuous Evaluation								
				End Term Evaluation	\$ Proficiency in subject /course	Mid Sem. Exam	Quiz/ Assignment		Lab Work & Sessional		Skill Based Mini Project						
1.	250501	DC	Computer Networks	50	10	20	20	-	-	-	100	3	-	-	3	Blended (2/1)	PP
2	250502	DC	Real and Complex Analysis	50	10	20	20	-	-	-	100	3	1	-	4	Offline (4/0)	PP
3	250503	DC	Software Engineering	50	10	20	20				100	3	-	-	3	Blended(2/1)	MCQ
4	250504	MC	Data Science using Python	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	MCQ
5	250505	DC	Optimization Techniques	50	10	20	20	-	-	-	100	3	1	-	4	Offline (4/0)	PP
6	250506	DLC	Minor Project-I	-	-	-	-	60	40	-	100	-	-	4	2	Offline (2/0)	SO
7	250507	DLC	Self-learning/Presentation# (NPTEL/SWAYAM/MOOC)	-	-	-	-	-	40	-	40	-	-	2	1	Online mentoring	SO
8	200xxx	CLC	Novel Engaging Course (Informal Learning)	-	-	-	-	50	-	-	50	-		2	1	Interactive	SO
9	250508	DLC	Summer Internship Project -II	-	-	-	-	60	-	-	60	-	-	4	2	Offline	SO
<b>Total</b>				<b>250</b>	<b>50</b>	<b>100</b>	<b>100</b>	<b>230</b>	<b>100</b>	<b>20</b>	<b>850</b>	<b>14</b>	<b>3</b>	<b>14</b>	<b>24</b>		
10	1000006	MAC	Disaster Management	50	10	20	20	-	-	-	100	2	-	-	<b>Grade</b>	Online	MCQ

\$ Proficiency in course/subject-includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

\$\$ MCQ: Multiple Choice Question \$\$ AO: Assignment + Oral

\$\$ PP: Pen Paper \$\$ SO: Submission + Oral

\*\* The Minor Project-I may be evaluated by an internal committee for awarding sessional marks.

# Compulsory registration for one online course using SWAYAM/NPTEL/MOOC, evaluation through attendance, assignments and presentation

Mode of Teaching						Mode of Examination					Total Credits
Theory				Lab	NEC	Theory			Lab	NEC	
Offline	Online	Blended		Offline	Interactive	PP	A+O	MCQ	SO	SO	
		Offline	Online								
8	-	6	3	6	1	3	-	2	3	1	24
33.337%	-	25%	12.5%	25%	4.17%	33.33%	-	22.22%	33.33%	11.11%	

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## List of Honor & Minor Specialization (for the batch admitted in 2021-2022).

Honours* (to be opted by students of Parent Department)	Minor Specialization* (to be opted by students of Other Department)
Software Testing	Introduction To Fuzzy Set Theory, Arithmetic And Logic
Cloud Computing	Matrix Computation And Its Applications
Cyber Security and Privacy	Introduction To Probability Theory And Stochastic Processes



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## Department of Engineering Mathematics & Computing

### Scheme of Examination

#### B. Tech. VI Semester

(Admitted batch 2021)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted									Total Marks	Contact Hours per week			Total Credits	Mode of Teaching (Offline/Online)	Mode of Exam.
				Theory Slot				Practical Slot			MOOCs			L	T	P			
				End Sem.		Mid Sem. Exam.	Quiz/Assignment	End Sem	Lab Work & Sessional	Skill Based Mini Project	Assignment	Exam							
				End Term Evaluation	Proficiency in subject /course														
1.	250601	DC	Computer Graphics	50	10	20	20	-	-	-			100	3	1	-	4	Offline	PP
2.	250602	DC	Compiler Design	50	10	20	20	-	-	-			100	3	1	-	4	Offline	PP
3.	250603	DE	Departmental Elective (DE-I)								25	75	100	3	-	-	3	Online	MCQ
4	250604	MC	Artificial Intelligence & Machine Learning (AI & ML)	50	10	20	20	60	20	20			200	3	-	2	4	Blended	MCQ
5.		OC	Open Category (OC-1)	50	10	20	20	-	-	-			100	3	-	-	3	Offline	PP/MCQ
6.	250605	DLC	Minor Project-II					60	40				100	-	-	4	2	Offline (2/0)	SO
7.	200xxx	CLC	Novel Engaging Course	-	-	-	-	50	-	-			50	-	-	2	1	Interactive	SO
Total				200	40	80	80	170	60	20	25	75	750	18	2	4	21		
Summer Internship-III (On Job Training) for Four weeks duration: Evaluation in VII Semester																			
8.	1000007		Intellectual Property Right (IPR)	50	10	20	20	-					100	2			GRADE	Online	MCQ

<sup>s</sup>Proficiency in course/subject-includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

<sup>ss</sup>MCQ: Multiple Choice Question    <sup>ss</sup>AO: Assignment + Oral    <sup>ss</sup>PP: Pen Paper    <sup>ss</sup>SO: Submission + Oral

<sup>\*\*</sup>The Minor Project-I may be evaluated by an internal committee for awarding sessional marks.

<sup>#</sup>Compulsory registration for one online course using SWAYAM/NPTEL/MOOC, evaluation through attendance, assignments and presentation

Mode of Teaching						Mode of Examination					Total Credits
Theory				Lab	NEC	Theory			Lab	NEC	
Offline	Online	Blended		Offline	Interactive	PP	A+O	MCQ	SO	SO	
		Offline	Online								
11	3	3	1	2	1	3		3	1	1	
52.38%	14.28%	14.28%	4.76%	9.52%	4.76%	37.5%		37.5%	12.5%	12.5%	

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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## Open Course (OC- I)

S. No.	Subject Code	Subject name
1		Advanced Numerical Techniques
2		Transform Calculus
3		Computational Fluid Dynamics

## DE –I (Through NPTEL)

S. No.	Subject Code	Subject name	Time Duration (Weeks)	Faculty Coordinator	Mentor Name and Affiliation
1	250605	Block chain and its application	12	<i>Dr. Minakshi Dhaiya / Dr. A. K. Ray</i>	Prof. Sandip Chakraborty, Prof. Shamik Sural from IIT Kharagpur
2	250606	Cloud Computing	12		Prof. Soumya Kanti Ghosh from IIT Kharagpur
3	250607	GPU Architectures and Programming	12		Prof. Soumya jit Dey from IIT Kharagpur
4	250608	Introduction to internet of things	12		Prof. Sudip Misra from IIT Kharagpur

## Minor Specialization

S. No.	Subject Code	Subject name	Time Duration (Weeks)	Faculty Coordinator	Mentor Name and Affiliation
1		A Primer to Mathematical Optimization	12	<i>Dr. Minakshi Dhaiya</i>	<i>Prof. Debdas Ghosh from IIT (BHU), Varanasi</i>
2		Advanced Linear Algebra	12		<i>Prof. Premananda Bera from IIT Roorkee</i>
3		Advanced Probability Theory	12		<i>Prof. Niladri Chatterjee from IIT Delhi</i>

## Honors Specialization

S. No.	Subject Code	Subject name	Time Duration (Weeks)	Faculty Coordinator	Mentor Name and Affiliation
1		Getting Started with Competitive Programming	12	<i>Dr. Minakshi Dhaiya</i>	<i>Prof. Neeldhara Misra from IIT Gandhinagar</i>
2		Advanced Graph Theory	8		<i>Prof. Rajiv Misra from IIT Patna</i>
3		Computer Vision & Image Processing Fundamental and Applications	12		<i>Prof. M. K. Bhuyan from IIT Guwahati</i>

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*\$\$The mode of exam of a course is based on the following:*

<b>Nature of Subject/Course</b>	<b>Theory/ Practical</b>	<b>Learning Levels</b>	<b>Preferable Mode of Examination</b>
Theoretical	Theory	Remembering, Understanding, Applying	MCQ Based
Computational/ Mathematical	Theory	Applying, Analysing	Pen Paper
Design / Drawing / Programming	Theory	Applying, Analysing, Evaluating, Creating	Assignment + Oral
Practical (Programming/ Knowledge/ Application)	Practical	Understanding, Applying	Submission+ Oral
Practical (Design/Analysis)	Practical	Analysing, Evaluating	Assignment + Oral
Projects	Practical	Creating, Evaluating, Analyzing	Submission+ Oral
MOOCs	Theory	As decided by the course mentor	Assignment + Proctored Examination