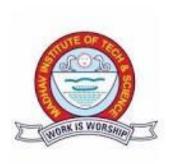
NAAC Criterion-I

Curricular Aspects

Key Indicator -1.1 Curriculum Design and Development

Sub-Criteria -1.1.2



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Gola ka Mandir, Gwalior - 474005, Madhya Pradesh, India

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR – 474005

(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal)

MECHANICAL ENGINEERING DEPARTMENT

		2019-2023 BATCH		2020-2024 BATCH	Percentage
SEM.	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	Change
	100101	Engineering Chemistry	100011	Engineering Mathematics-I	25.42
	100102	Engineering Mathematics-I	100012	Engineering Chemistry	
	100103	Technical English	100014	Engineering Graphics	
I	100104	Basic Electrical & Electronics Engineering	100015	Energy, Environment, Ecology & Society	
	100105	Engineering Graphics	100016	Technical Language	
	100106	Manufacturing Practices	100017	Language Lab	
		•	100018	Engineering Graphics Lab	
	100201	Engineering Physics	120211	Material Science	
	100202	Energy, Environment, Ecology & Society	100020	Basic Civil Engineering & Mechanics	
	100203	Basic Computer Engineering	100021	Basic Mechanical Engineering	
П	100204	Basic Mechanical Engineering	100022	Basic Electrical and Electronics Engineering	
	100205	Basic Civil Engineering & Mechanics	100023	Basic Computer Engineering	
	100206	Language Lab. & Seminars	100024	Manufacturing Practices	
			120026	Basic Mechanical Engineering Lab	
	100001	Engineering Mathematics-II	100025	Engineering Mathematics-II	
	120301	Material Science	120311	Manufacturing Processes	
	120302	Mechanics of Materials	120312	Mechanics of Materials	
	120303	Theory of Machines –I	120313	Theory of Machines –I	
III	120304	Fluid Mechanics and Hydraulic Machines	120314	Fluid Mechanics and Hydraulic Machines	
111	120305	Software Lab	120315	Software Lab	
	120306	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	120316	Self-learning/Presentation	
	120307	Summer Internship Project–I (Institute Level) (Evaluation)	200XXX	Novel Engaging Course	
			120318	Summer Internship Project–I	
			1000001	Indian Constitution and Traditional Knowledge	
	100003	Mathematics- III	100003	Mathematics- III	
	120401	Theory of Machines –II	120411	Theory of Machines –II	
	120402	Design of Machine Elements	120412	Design of Machine Elements	
IV	120403	Manufacturing Processes	120413	Metal Cutting and Machine Tools	
• 1	120404	Engineering Thermodynamics	120414	Engineering Thermodynamics	
	100004	Cyber Security	100004	Cyber Security	
	120405	Production Lab	120415	Production Lab	
	100002	Biology for Engineers	200XXX	Novel Engaging Course (Informal Learning)	
			1000002	Biology for Engineers	
	120501	Industrial Engineering	120519	Data Science	

1 [120502	Metal Cutting and Machine Tools	120511	Industrial Engineering
	120502	Heat and Mass Transfer	120511	Heat and Mass Transfer
-	120503	Thermal Engineering	120513	Thermal Engineering
-	120504	Machine Design	120514	Machine Design
-	120506	Minor Project-I	120516	Minor Project-I
V	120507	Summer Internship Project-II (Evaluation)	120517	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)
	120307	Summer meensmp 110ject-n (Evaluation)	120317	Sch-leanning/Fleschauton (SWATAW/NFTEE/WOOC)
	120508	Self-learning/Presentation (SWAYAM/NPTEL/MOOC)	200XXX	Novel Engaging Course (Informal Learning)
			120518	Summer Internship Project-II (Evaluation)
			1000006	Disaster Management
			1000005	Project Management & Financing
	100005	Ethics, Economics, Entrepreneurship & Management	120615	Mechanical Vibrations
	120601	Advance Production Technology	120616	Refrigeration and Air-Conditioning
	DE	120611 Vibration and Noise Engineering	120617	Artificial Intelligence & Machine Learning
		120612 Statistical Quality Control		
		120613 Work Study and Ergonomics		
		120614 Turbo Machinery		
	DE	120652 Fundamental of Welding Science and Technology	DE	120661 Fundamental of Welding Science and Technology
VI		120654 Viscous Fluid Flow		120662 Viscous Fluid Flow
		120655 Properties of Materials (Nature and Properties of Material: III)		120663 Properties of Materials (Nature and Properties of Material: III)
		120656 Nature and Properties of Materials		
•	OC	900101 Robotics	OC	910108 Product Design
		900102 Product Design		910109 Robotics
	100007	Disaster Management	120618	Minor Project-II
	120605	Minor Project-II	200XXX	Novel Engaging Course (Informal Learning)
	100006	Indian Constitution & Traditional Knowledge (Audit Course)	100008	Intellectual Property Rights (IPR)
	DE	120711 Refrigeration and Air-Conditioning	DE	120713 Metrology, Measurement and Control
		120713 Metrology, Measurement and Control		120714 Total Quality Management
		120714 Total Quality Management		
	DE	120751 Foundation of Computational Fluid Dynamics	DE	120751 Foundation of Computational Fluid Dynamics
		120752 Introduction to Composites		120752 Introduction to Composites
		120753 Advanced Machining Processes		120753 Advanced Machining Processes
VII	OC	900203 Industrial Automation	OC	900203 Industrial Automation
, , ,		900204 Solar Energy		900204 Solar Energy
	OC	900214 Engineering Materials for Industrial Applications	OC	900214 Engineering Materials for Industrial Applications
		900215 Maintenance Engineering		900215 Maintenance Engineering
	100008	Intellectual Property Rights (IPR)	120701	Reliability and Vibration Lab
	120701	Reliability and Vibration Lab	120702	Summer Internship Project-III (04 weeks) (Evaluation)
	120702	Summer Internship Project-III (04 weeks) (Evaluation)	120703	Creative Problem Solving (Evaluation)
	120703	Creative Problem Solving (Evaluation)		
	D.F.	120051 0 15 D 1 1 1 0 1	D.F.	Manage of the Date of the Control of
	DE	120851 Quality Design and Control	DE	120851 Quality Design and Control
		120852 Robotics: Basics and Selected Advanced Concepts		120852 Robotics: Basics and Selected Advanced Concepts
1		120855 Carbon Materials and Manufacturing	1	120855 Carbon Materials and Manufacturing

VIII		900605 Waste to Energy Conversion 900609 Product Design and Manufacturing 900610 Automatic Control		900605 Waste to Energy Conversion 900609 Product Design and Manufacturing 900610 Automatic Control	
	120801	Internship/Project	120801	Internship/Project	
	120802	Professional Development	120802	Professional Development	

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering
GROUP B: I Semester For batches admitted in Session 2019-20

B. Tech. I Semester (Mechanical Engineering)

	Subject	Category	Subject Name		Ma	ximum Marks A	Motted		Total	Contac	t Hours p	er week	Total	
S.No	Code	Code			Theory	Slot	Prac	tical Slot	Marks				Credit	
		20.200		End Sem.	Mid Sem.	Quiz/ Assignment	End Sem.	Lab work & Sessional		L	т	P		
1	100101	BSC	Engineering Chemistry (BSC-1)	70	20	10	30	20	150	3	*	2	4	
2.	100102	BSC	Engineering Machematics-I (B5C-2)	70	20	10	13	100	100	3	1	*	4	
3.	100103	HSMC	Technical English (HSMC-1)	70	20	10	30	20	150	3	-	2	4	
4.	100164	ISC	Basic Electrical & Electronics Engineering (ESC-1)	70	20	10	30	20	150	3	×	2	4	
5.	100105	ESC	Engineering Graphics (ESC-2)	70	20	10	30	20	150	3	*	2	4	
6.	100106	ESC	Manufacturing Practices (ESC-3)	*		*	30	20	50			2	1	
			Total	350	100	50	150	100	750	15	1	10	21	
		NSS/NO	cc					Qualifie						
		Induction		amme of first three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept/Branch & Innovations										

GROUP A: (Electrical, Electronics, Computer Science& Engineering, Information Technology, Electronics & Telecommunication GROUP B: (Civil, Mechanical, Chemical, Biotech, Automobile) 01Theory Perioda = 1 Credit 22 Practical Perioda = 1 Credit



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

Group B: II Semester For batches admitted in Session 2019-20

B.Tech. II Semester (Mechanical Engineering)

5.No	Subject	Category	Subject Name		Max	imum Marks	Allotted		Total	Contac	t Hours p	er week	Total
	Code	Code			Theory S	Slot	Prac	tical Slot	Marks				Credits
		200000		End Sem.	Mid Sem Exam	Quiz/ Assignme nt	End Sem.	Lab work & Sessional		L	T	P	
1.	100201	BSC	Engineering Physics (BSC-3)	70	20	10	30	20	150	2	1	2	4
2.	100202	нямс	Energy, Environment, Ecology & Society (HSMC-2)	70	20	10			100	3	-	×	3
3	100203	ESC	Basic Computer Engineering (ESC-4)	70	20	10	30	20	150	3	7-1	2	4
4	100204	ESC	Basic Mechanical Engineering (ESC-5)	70	20	10	30	20	150	3		2	- 4
5.	100205	ESC	Basic Civil Engineering & Mechanics (ESC-6)	70	20	10	30	20	150	3	-	2	4
6.	100206	нямс	Language Lab. & Seminars (HSMC-3)	-	- 8	35	30	20	50	50	- 3	4	2
			Total	350	100	50	150	100	750	14	1	12	21
		NSS/NO	c					Qual	ifier				

Summer Internship Project -I (Institute Level) (Qualifier): Minimum two-week duration

GROUP A: (Electrical, Electronics, Computer Science, Engineering, Information Technology, Electronics & Telecommunication)
GROUP B: (Civil, Mechanical, Chemical, Biotech, Automobible)
01Theory Period = Credit 19 Period = 1 Credit

M- = wan Ber put on

REVISED SCHEME (2020-24)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute& NAAC Accredited Institute Affiliated to RGPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

For batch admitted in Academic Session 2020-2021

B.Tech. I Semester (Mechanical Engineering)

						Maximu	n Marks Allott	ed				- 0	outa	t.			
	nosus a				Theory S	dot			Practical Slo	it	5.0000		meek		UDARGO	Mode of	Mode
5. No.	Subject	Category	Subject Name	End	Sem.	Mid			Lab Work	Skill	Total Marks		1		Total Credits	Teaching (Offline/	of
30.	Code	Code	ing Federal	End Term Evaluation	Proficiency in subject /course	Sem. Exam	Quiz/ Assignment	End Sem	& Sessional	Based Mini Project	MATE	L	Т	P	Cream	Online)	Exam.
1.	100011	BSC	Engineering Mathematics-I (BSC-1)	50	10	20	20	-	797	-	100	3	1	-	-4	Offline (4/0)	PP
2.	100012	BSC	Engineering Chemistry (B5C-2)	50	10	20	20	60	20	20	200	2	1	2	-4	Blended (2/1)	MCQ
3.	100014	ESC	Engineering Graphics (ESC-1)	50	10	20	20	+	-	· **	100	1	2	-	3	Offline (3/0)	A+0
4.	100015	RSMC	Energy, Environment, Ecology & Society (HSMC-1)	30	10	20	20	20	(20)		100	3			3	online (3/0)	MCQ
5.	100016		Technical Lauguage (HSMC-2)	50	10	20	20	+	-	(2)	100	3	-	*	3	Blended (2/1)	PP
6.	100017	RSMC	Language Lab (HSMC-3)	(%)	197		*	60	20	20	100			2	1	Office (1/0)	50
7	100018	ESC	Engineering Graphics Lab (ESC-2)			-	- 8	60	20	20	100	-		2	1	Offline (1/0)	50
		Total) ·	250	50	160	100	180	60	.60	500	12	4	6	19		

Induction programme of three weeks (MC):Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminest People, Visits to local Areas, Familiarization to Dept. Branch & Innovations.

	3	dodr of Track	ing			Mode of E	zamination		
	T	heory.		Lab		Theory		Lab	Total Credits
evenu.	en en e	Bles	aded	rann.	no.	A+0	3400	50	
Offline	Online	Offline	Ouline	Offline	PP	ATO	MCQ	SO	19
7	3	4	2	3	7	3	7	1	19
36.54	14.5	21.6	10.5	15.71	36.54	14.76	36.54	10.5	100



MADBAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Instituted NAAC Asseedited Institute Affiliated to RGPV, Shopal MF)

Deportment of Mechanical Engineering Scheme of Evaluation

sich admitted in Academic Session 2020-2021

B.Tech, II Semester (Mechanical Engineering)

						decimen	Marks Alle	Bests				Com	teet B	leurs.			
					Theory 5	lot			Practical 5h	HE .		P	er we	rk .		Mode of	
No.	Subject		Subject Name	East	FProfeser:	Mid	Quis/		Lab Work	SAME	Yorks Marks				Total Credita	Teaching	Mode of
	Code	Code		Evaluation	in rabject frames	Sem. Exam.	Arrigumen	End Sem	A Secretarial	Mini Project	Martin	L	т	r	Carden	(Office)	Eson
1.	120211	DC	3Esternal Sinissore (DC+1)	30	10	20	20	14		19	100	3			3.	Blesded (2/5)	20
2.	1.66836	BRC	Basic Civil Engineering & Mechanics (ESC-1)	16	10	20	36	25		15	100	2	1	-	3	Bleufed (2/1)	pr.
3.	1.000025	ESC	Basic Mechanical Engineering (ESC-4)	30	10	20	20	25	2:	04	100	2	1		3	Blessled (2:1)	MOQ
4.	100622	ESC	Best Electrical and Electronics Engineering (ESC-5)	50	10	20	30	60	30	36	200	2	.3	3	4	Blesded (2:1)	3800
5.	100023	ESC	Best Coupuse Engineering (ESC-4):		10	20	30	60	40	Ç4	200	2	1	2	ä	Binuted (2:1)	840
6.	1.00034	ESC :	Mundschring Practices (ESC-7)	- 5	353	120	==	60	36	20	100	8	-	2	1	Officer (1-0)	50
7.	120654	isc	Beste Mechanical Engineering Lab (ESC-40	*:	30.0		- 5	60	30	20	100	2.		2	ż	Offline (1-0)	50
		Total		259	79	100	100	240	100	- 65	700	11	4		19		

		Mode of Teach	ing .			Mande of E	Canadia etileig		
		heury		Lab		Theory		Lab	Total Credits
Office	Outer	Officer	Online	Officer	PF.	AHO	MCQ	30	19
		1.0	-	- 4	4	- 4	1	2	19
-		43.4	24.9	51	12.4	81	76.80	18.6	100



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering B.Tech. III Semester (Mechanical Engineering)

No.	Subject Code	Category	Subject Name		1	Maximum Mark	s Allotted	111233	Total Marks	Cont	act H	-	Total Credits
					Theory	Slot	Pr	actical Slot		1.			
				End Sem.	Mid Sem.	Quiz/ Assignment	End Sem	Term work		L	T	P	
					Exam.		(51.00)	Lab Work & Sessional					
1.	100001	BSC	Engineering Mathematics-II (BSC-4)	70	20	10	*		100	3	1		+
2.	120301	ESC	Material Science (ESC-7)	70	20	10		81	100	-3	1		+
3.	120302	DC	Mechanics of Materials (DC-1)	70	20	10	30	20	150	3	-	2	4
4.	120303	DC	Theory of Machines -I (DC-2)	70	20	10	30	20	150	3	. *	2	4
5.	120304	DC	Fluid Mechanics and Hydraulic Machines (DC-3)	70	20	10	30	20	150	.3		2	4
6.	120305	DLC	Software Lab (DLC-1)	75	120	- 5	30	20	50	25	-	2	- 1
7.	120306#	SEMINAR/ SELF STUDY	Self-learning Presentation (SWAYAM/NPTEL/MOOC)	*	-	+	*	25	25	2		2	1
8.	120307	DLC	Summer Internship Project-I (Institute Level) (Evaluation)	-	1911	*	25		25			4	2
			Total	350	160	50	145	105	750	15	2	14	24

[&]quot;Virtual Lab to be conducted along with the traditional lab

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



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering B.Tech. IV Semester (Mechanical Engineering)

Exam	Total Credin	er ber	tact Hou	Com	Total Marks		Allotted	daximum Mark:	7		Subject Name	Categor y Code	Subject Code	S. No.
,x100	Cream		merk.		MARKE	rtical Slot	Prac	lot	Theory Si			7 Cade	Caue	(40.
	1	P	T	L		Term work	End Sem.	Quiz/ Assignment	Mid Sem. Exam.	End Sem.				
						Lab Work & Sessional		1.000.00 - 2.00.000.						
PP	4		1	3	100	72	100	10	20	70	Mathematics- III (BSC-5)	BSC	100003	1.
PP	-4	2	1	2	150	20	30	10	20	70	Theory of Machinet -II (DC-4)	DC	120401	2.
AO	4	2	1	2	150	20	30	10	20	70	Design of Machine Elements (DC-5)	DC	120402	3.
MCC	4		1	3	100	7.8		10	20	70	Manufacturing Process (DC-6)	DC	120403	4.
PP	4	-	1	3	100	-	-	10	26	70	Engineering Thermodynamics (DC-7)	DC	120404	5
MCC	3		1	2	100	- 55	1.2	10	20	70	Cyber Security (MC)	MC	100004	6.
	2	4		8	50	20	30	(3)	399		Production Lab (DLC-2)	DLC	120405	7.
	24	- 8	- 6	15	750	40	90	60	129	420	Total			
MCC			1.0	.5.	100			10	20	70	Biology for Engineers (Audit Course-I)	Audit	100002	8.
						Qualifier					NCC	NSS/		

Virtual Lab to be conducted along with the traditional lab

Course will run for Group A/B in IEEE's semester respectively. Farsing is optional; however a separate mark sheet will be issued to those who qualify. GROUP B: (Civil, Mechanical, Chemical, Blotech, Automobile)



REVISED SCHEME (2020-24)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous Institute & NAAC Accredited Institute Affiliated to RGPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

For batch admitted in Academic Session 2020-2021

B.Tech. III Semester (Mechanical Engineering)

5.	Subject	Category	Subject Name				n Marks Allo	tted.						fours			
No.	Code	Code			Theory S	lot	77-10-7		Practical Slo	d.		P	er me	ek		Mode of	Mode
				End Term Evaluation	Sem. Proficiency in subject/course	Mid Sem. Exam.	Quiz/ Assignment	End Sem	Lab Work & Sessional	Skill Based Mini Project	Marks	L	r	P	Total Credits	Teaching (Office Online)	Exam of
1.	10002.6	BSC	Engineering Mathematics-II (BSC- 3)	50	19	20	20	×		-	100	2	1		3	Offline (3/9)	3P
2.	12091.1	DC	Manufacturing Protectes (DC-2)	50	10	20	20	5.5	87	2	100	2	1	35	3	(2/1)	19
3.	15491.5	:D<	Mechanics of Materials (DC-3)	50	10	20	2:0	60	20	20	200	2	-	2	3	Office (3/0)	100
4.	126913	ВС	Theory of Machines -1 (DC-4)	50	10	26	26	60	26	20	200	2	1	2	4	Blended (2/L)	AO
S.	12031.4	DC	Fluid Mechanics and Hydraulic Machines (DC 2)	50	10	20	2:0	60	20	20	200	2	1	2	4	Bleaded (2/1)	201
6.	129717	DLC	(DLC-1)	¥:	- 2	-		60	20	20	100			2	- 1	Offline (1/0)	50
7.	120314	DLC	Self-learning/ Presentation	- 4	×	-	1041	2	40	- 14	40	-	*	2	1	Online +Mentoring	so
8.	2003232	CLC	Novel Engaging Course	*:		100	1040	50			50	*	100	2	1	Interactive	50
9.	126515	DLC	Summer Internation Project-I (Instead Level Projector)	8		-	(#)	60	1-	1-	60	1+		+	2	Offline	so
		Total		250	50	100	100	350	120	80	1050	10	1	16	22		
10	1000001	MAC	Indian Constitution and Traditional Knowledge	50	10	20	20	1	3.	12	100	2		3	Grade	Online	MCQ

Proficiency in course/object - includes the weightage towards shiftly shall competence has wholey level expective attained intendance etc. in that particular course/object Computency registeration for one online course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC, evaluation for one of the course using SVAVAM-SPIEL MOSC.



MADRAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute& NAAC Accredited Institute Affiliated to RGPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

For batch admitted in Academic Session 2020-2022

B. Tech. IV Semester (Mechanical Engineering)

54,	Subject	Catego	Subject Name		1	Maximum	Marks Allos	ted				Cont	tact I	Iours			
No.	Code	ry	31 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Theory S	Set	-		Practical Slo	of		pe	r we	elc.		Mode of	
		Code		End	1 Sem.	Mid	Quit/	End	Lab Work	Statt	Total	L	T	P	Total	Teaching	Mod
				End Term Evaluation	in unbject /course	Sem. Exam.	Assignmen	Sem	Sessional	Mini Project	Marks				Credits	(Offline Online)	Exam
1.	1004003	BSC	Mathematics-III (BSC-4)	50	10	20	20	-		17	100	2	1		3	Offline (3-0)	3.5
2.	120-411	DC	Theory of Machinet -II (DC-6)	50	10	20	20	60	20	20	200	2	1	2	-4	Bleaded (2/1)	AO
5.	120-413	E)C	Design of Machine Elements (DC-7)	540	10	20	20	60	20	20	200	2	1	2	-4	Blended (2/1)	AO
4.	120-41.)	DC:	Metal Curtise and Machine Tools (DC-8)	50	10	20	20	-	(91)		100	2	1		3	Bleaded (2/1)	19
5.	120-43-4	DC	Engineering Thermodynamics (DC-9)	50	10	20	20		(#)	78	100	2	1		3	Blended (2/1)	199
6.	100004	MC	Cyber Security (MC)	340	10	20	20		57.0	- 23	100	2	15	-	-2	Online (0/2)	MCC
7,	129416	DEC	Production Lab (DLC- 2)	-	7-1	2		60	20	20	100	- 2		4	2	Offline (2.0)	50
ŝi.	XX.2000	crc	Novel Engaging Course	(**:	1.50	8		50		3	50	.5	25	2	.1	Interactive	SÕ
		Total		300	60	120	120	230	69	60	950	12		12	22		
			Summer I	nternahîp l	Project-II (Se	oft skills	Based) for	two v	veeks durat	ion: Eva	luation	n V S	eme	ster			
9.	1000042	MAC	Biology for Engineers	50	10	20	20		*		100	2	*	-	Grade	Ouline	MCQ

** Printing Law on community along within the areation in the production of the parties are a community of the parties are a parties attained attendance etc. in that particular course radigest



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Goyt, Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhonal) Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

Semester	For batches admitted	in Session 2019-2

S.	Subject	Category	Subject Name		Ma	simum Marks A	llotted		Total	Contact	hours p	er week	Total
No.	Code	Code			Theory:	Slot	Pr	actical Slot	Marks				Credits
552,742		78500		End Sem.	Mid Sem Exam.	Quiz! Assignment	End Sem.	Lab work & Sessional		L	T	P	
1.	120501	DC	Industrial Engineering (DC-8)	70	20	10	- 10	*0	100	3		- 1	3
2.	120502	DC	Metal Cutting and Machine Tools (DC-9)	70	20	10	35	16	100	3	1		4
3.	120503	DC	Heat and Mass Transfer (DC-10)	70	20	10	30	20	150	2	1	2	4
4.	120504	DC	Thermal Engineering (DC-11)	70	20	10	30	20	150	2	1	2	4
5.	120505	DC	Machine Design (DC-12)	70	20	10	30	20	150	2	1	2	- 4
6.	120506**	DLC	Minor Project-I (DLC-3)	-	- 3	6	30	20	50		3.65	2	1
7.	120507	DLC	Summer Internship Project-II (Evaluation) (DLC-4)	150		25%	25	51	25	2.		6	3
8	120508	SEMINAR/ SELF STUDY	Self-learning Presentation (SWAYAM/NPTEL/ MOOC)	*		*		25	25	3	•	2	1
			Total	350	100	50	145	105	750	12	4	16	24

Department level activity/workshop/awareness programme to be conducted; certificate of compliance to be submitted by HoD to the Exam Controller through Dean Academics

Additional Courses for obtaining Honours or minor Specialization by desirous students

Permitted to opt for maximum two additional courses for the award of (i) Honours in parent discipline or (ii) Minor Specialization in engineering discipline other than the parent discipline

*Compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance, assignments and presentation GROUP B: (Civil, Mechanical, Chemical, Biotech, Automobile) 01Theory Period=1 Credit; 02 Practical Periods =1 Credit

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Goott Aided EGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Rhonalli

Department of Mechanical Engineering

						VI Semeste				Fe	or hutches	odh				
No.	Subjects	Category	Subject Name		-			Lateral Land		0.0	Total Marks	١.	Ciss		Total	Harana Moder
100	Code	Code			Theory 5	Size.	Fra	erted Slot	MED	430	(Marrie)		Hear		Credin	Stroom
				End Sem	Mid Sem	Quite Arrignment	End Son.	Lab work: & Sectioned	Arriga: secut	Ense	1	H.	1	F		
E.	10999.	HSMC	Estics, Erasonics, Extreperaeurship & Messegonest: (BSMC_0)	70	29	10	-	-	- 186		100	3		- 1	3	sacg
7	3/20494	K	Allower Production Technology (DC-43)	70	29	201	30	29			1540	2	1.5	2	-1	146
3.	DiC	DE	Departmental Elective 1:206-1:	70	.20	101	-	-	-		190	-4		-	- 4	79
4.	Dif.	DIE	Departmental Elective 2:316-24		-	-			25	- 5	1945	1.4		-	-4	5400
3	ÖK.	OC.	Open Category (OC-2)	70	26	10	-		-		1040	13		-	3	166
16.	THERET?	MC	Discover Management (MIC)	70	36	10-			-		3040	13	-	-	- 9	1400
7.	1:20ebd	DEX	Misser Project-E (DL/C-F)	1.0	-		.59		-	-	1040	-	-	-8	2	
			Tostal	350	286	.50	30	76	26	75	754	12	1	-16	2)	
ıt	140mil	Andi: Courte	Indian Constitution & Traditional Emerledge (Andir Course S)	76	39	281					384	3				
				590800	er Danneschilp	THE ROLLING TO	ming f	int Four weeks o	decration: E	rolleurbies I	in VIII Senne	340				
ибеві	sing Boson elization h		Permitted to ope	fine mass	incom Pres and			ercord of (i) His other rises, the p			line or (ii) h	Daver	Sgec	islicati	m.(m)	

	58.1 (The	rega Tro-Barwal Model	_		DIE-1 ^{as}			Specificage (OCS)	
5.75m	Subject Code	Selliport Young	5.No.	Indignet Code	Subject Name	M.Na.	Subject Colle	Subject Name	
	1259011	Name and Name Reports	1	CORNE	Fundaments of Tricking Science and Lecturings	1	MODELLE	Editoria	
7.	125812	SHEET GLAST CARRY	12	1,7804	Toron That Fore	17	MESTE	Trodut Desgr	
	139601	Trial Wally and Expenses	1	Louis	Properties of Philippine (College and Properties of Minnes), III)				
4	139604	Teles Michaely	4	CHES	Notice and Property: of Nationals				

Group A/B programmer will offer this course in VAT Semester respectively.

This courses offices through 5 to AYAM:NTEL/MOOC

Group A B programmer will offer this course in UVI Semester properties). Paring it agricual, Borners a separate much these will be inseed to those who qualify.

M- E was Reg was

REVISED SCHEME (2020-24)

MADHAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institutes, NAAC Accredited Institute Affiliated to RGPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

B. Tech. V Semester (Mechanical Engineering) Mariness Marks Alletted

No.	Code	Code	Subject Name			MININ	mum Numero A	monea					ours 3				
.760.	Code	Crox			Theory	Slat			Practical St	oł		- 11	week			Mode of	
					Term Justion		atianous aluation	End	Contin Evalu		Total Marks	L	T	P	Total Credit	(Online, Offline,	¹⁰ Mod of
				End Sem Exam	Proficiency in subject /course	Mid Sem. Exam.	Quaz/ Assignment	Sem.	Lab work & Seminal	Skill Based Mini Project						Bleaded)	Exam
1	120519	MC	Data Science	50	10	29	30	60	20	20	200	3		2	4	Blended (2/1)	MCQ
2	126511	DC	Industrial Engineering (DC-10)	50	10	20	30		-	-	100	1	-	-	3	Blesdel (2/1)	PP
3.	120513	DC	Heat and Mans Transfer (DC-11)	50	10	20	30	50	20	20	200	2	1	2	-4	Blended (2/1)	PP
4	120514	DC	Thermal Engineering (DC-12)	50	10	29	20	. 60	20	20	200	2	1	2	-4	Blended (2/1)	PP
5.	120515	DC	Machine Design (DC-13)	50	10	20	20	60	20	20	200	2	1	2	4	Blended (2/1)	AO
6.	120516	DLC	Minor Project I**	-	383	- 14	-	60	40	- 100	100	-	-	4	2	Office (2/0)	50
2.	120517	Seminar/ Self-Study	Self-learning Presentation (SWAYAM/NPTEL/MOOC)*	141	100	19	9.	-	40		40			2	1	Online +Meatoring	50
8.	200XXX	CLC	Notel Engaging Course (Informal Learning)	(90)		9		50	-	-	50			2	1	Interactive	50
9.	120513	DLC	Summer Internship Project-II (Evaluation)	157.0	1,00	.05		60	1577	1.5	60		-	4	2	Offline	50
			Total	250	50	100	100	419	160	30	1150	12	3	20	25		-
10.	1000006	MAC	Disaster Management	50	10	20	20	-	-	-	100	2		~	Guide	Online	MOQ
21.	1000005	MAC	Project Management & Financing	50	10	20	20	(w)			100	2		-	Grade	Online	MOQ
Adde	ional Course	for Honours	or minor Specialization	Permitted	to opt for must	umins to	ro additional c	ourses for	the award of	Honours or	Miner spec	ializati	ion.				

proficione; in course indiges includes the weightings towards ability shill competence have being level, superties attained set, in that particular course indiges.

"MOC, Maingine Choice Question." And Assignment - One.

"Ph. Per Tope."

"Ph. Per Tope."

"Bo. Schemistics—One of the Course of the



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute& NAAC Accredited Institute Affiliated to RGPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

For batch admitted in Academic Servion 2020-2021

Scheme of Evaluation

R. Tach, VI Semester (Machanical Engineering)

5.	Subject	Category	Subject Name				Maximum)		lotted						onta					
Va.	Code	Code			Theor	y Slot			Practical S	lot	МО	OCs			meek			Mode		
					l Term Instion		dimuous dustion	End	Conti Evalu	nwows sation	Assign -ment	Exam	Total Marks	L	T	P	Totali Credin	of Teaching	"Mode of	Dura -on of
_				End Sem. Exam.	Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignme at	Sem. Exam.	Lab work & Sessional	Skul Bated Mini Project									Exam.	Exam
1.	120615	DC	Mechanical Valuations (DC-14)	50	10	20	20	60	20	20	12	120	200	2	1	2	4	Blended	PP	2 kg
2.	120616	DC	Refrigeration and Air- Conditioning (DC-15)	50	10	20	20	60	20	20	- 12		200	2	1	2	4	Blended	PP	2 hr
3.	120617	MC	Artificial Intelligence & Machine Learning	30	10	20	20	60	20	20	1/2	·*	200	3		2	4	Blended	MCQ	15h
4.	DE	DE	Departmental Elective* (DE-1)		2+3	3.00	140			*	25	75	100	3	٠	-	3	Osline	MCQ	
5.	oc	oc	Open Category (OC-1)	50	10	20	20					-30	100	2	1		3	Blended	PP	23m
6.	120618	DLC	Masor Project-II	(4)	(3)	100	3	60	40	54	12	-	100	jų.	+	4	2	Offine	50	
7.	200X XX	CLC	Novel Engaging Course (Informal Learning)	(4)	(*)		(40)	50	-	94	74		50	1,4	14.5	2	1	Office	50	
		Te	tal	200	10	80	SB	290	100	60	25	75	950	112	3	12	21	-		
1.	100008	MAC	Intellectual Property Rights (IPR)	50	10	20	20	- 5	8	3.5	17	30	100	2	-	-	Grade	Online	MC Q	1.5 hr
					Summer Int	ernthip-E	II (On Job Tr	aining) f	or Four wee	iks duration	: Evalua	tion in '	VII Semes	ter						
444	L Course f	or Honour	or minor Specialization				d to opt for a								BWE S	pecia	lization			

Pardiciency in course subject-includes the weightings towards ability fulfil competence has onledge level expertise attained sts. in that particular course subject. "MCQ: Multiple Chaice Question: "AD: Assignment = Ond. "FF: First Paper." "DO: Submitton = Ond."
"Course our furnity STAYAMINTEL MODG Learning Board Hafeton with credit transfer.

		Departmental Elective (DE-L*)		Open Category (OC-1)
S.Na.	Subject Code	Subject Name	5.No.	Subject Code	Subject Name
1	120661	Fundamental of Welding Science and Technology	1	91016S	Product Design
2	120662	Vincous Fluid Flow	2	910109	Raboten
1	120663	Properties of Materials (Nature and Properties of Material III)			



[&]quot;The minor project-I may be evaluated by an internal committee for awarding Sessional marks.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

VII Somester For batches admitted in Session 2019-20

S.No.	Subject	Category	Subject Name & Title			Maci	moun Ma	rks Alletted			3 5		onts		Total
	Code				Theory	Slot	Pra	etical Slot	MOOG	3	Total		PHET?		Credit
				End	Mid Sem.	Quiz/ Assignment	End Sem.	Lab Work & Sectional	Assignment	Exam	Marks		neel	S	
				Sem		Assignment	Sem.	а зепини				L	T	P	
1.	DE	DE	Departmental Elective-3 (DE-3)	70	20	10	-		-	-	100	4	-		4
2	DE+	DIE	Departmental Elective 4 (DE-4)	-	5		-		. 25	-75	100	2	-		- 2
3.	OC.	OC	Open Category-2(OC-2)	70	20	10	-	-	-	-	100	2	1	-	3
4.	oc	OC.	Open Category -3-(OC-3)	70	20	10	-	-	-	-	100	3	-	-	3
3.	190008	MC	Intellectual Property Rights (IPR) (MC)	70	20	10					100	2	-	-	2
6.	120701	DLC	Reliability and Vibration Lab (DLC-6)	199	12		50	.30	-	-2	100	-		4	2
7.	120702	DLC	Summer Internship Project-III (04 week: Evaluation) (DLC-7)		25	**	50	50	*	**	100	-	-	4	2
8.	120793	DLC	Creative Problem Solving (Evaluation) (DLC-5)	-	-		25	25	-		50	-	-	2	1
			Total	280	50	40	1.25	125	25	75	750	13	1	10	19

1	E-3 (Three	ugh Traditional Mode)		DE	4* (Online mode)		Open Cate	guey (OC-2)		Open C	ategory (OC-3)
S.No.	Subject Code	Subject Name	S.No.	Subject Code	Subject Name	S.No.	Subject Code	Subject Name	5.No.	Subject Code	Subject Name
1	120711	Refrigeration and Air- Conditioning	1	120751	Foundation of Computational Fluid Dynamics	1	900203	Industrial Automation	1	900214	Engineering Materials for Industrial Applications
2	130713	Metology, Measurement and Control	2	120752	Introduction to Composites	2	900204	Solar Energy	2	900215	Muintenance Engineering
3	120714	Total Quality Management	3	12/07/53	Advanced Machining Processes						

^{*}This course must be run through SWAYAM/NPTEL/MOOC



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Mechanical Engineering

Scheme of Examination: Bachelor of Technology (B.Tech.) Mechanical Engineering

S.No.	Subject	Category	Subject Name &			Maxi	mum M	larks Allotted	1		Total	- (ontac	t	Total
	Code	57.77	Title		Theor	y Slot	Prac	etical Slot	MOOC	5	Marks	H	surt p	er	Credits
				End	Mid	Quiz/	End	Lab					week		
				Sem.	Sem	Assignment	Sem.	Work & Sessional	Assignment	Exam		L	T	P	
L	DE.	DE	Departmental Elective - 5* (DE-5)		*	7.	*	*	25	75	100	4	*	•	4
3.	oc.	oc	Open Category – 4* (OC-4)	19		•	*		25	75	100	2	14.1		2
4.	120801	DLC	Internship/Project (DLC-9)			-20	250	150		×	400	-	*	12	6
5.	120802"	PD	Professional Development	-			-	50	-	-	50			2	- 1
			Total	72		20	250	200	50	150	650	6	-	14	13

	(De	partmental Elective) DE-5*		Open	Category (OC-4)*
S.No.	Subject Code	Subject Name	S.No.	Subject Code	Subject Name
1	120851	Quality Design and Control	1	900605	Waste to Energy Conversion
2	120852	Robotics: Basics and Selected Advanced Concepts	2	900609	Product Design and Manufacturing
3	120855	Carbon Materials and Manufacturing	3	900610	Automatic Control

*All of these courses will run through SWAYAM/NPTEL/ MOOC "Evaluation will be based on participation laurest brought by the students to the institution in autional/state level technical and other events during the complete tenure of the UG

program(participation in professional chapter activities, club activities, cultural events, sports, personality development activities, collaborative events, MOOCs and technical event.



REVISED SCHEME (2020-24)

MADRAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute& NAAC Accredited Institute Affiliated to RGPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

For batch admitted in Academic Session 2020-202

\$.	Subject	Categ	Subject Name				Maximum N	Incks A	Horte-d						stact H				
No.	Code	Code	8 8		Theory S	lot			Practical Si	ot	MO	OCt	Total	1	HE BE	rk.	Total	Mode of	
		Cone		End	Sem.	Mid	Quiz/	End	Lab	Skill	Assign-	Exam.	Mark	L	T	P	Credit	Teaching	Mode of
				End Term Evaluation	Proficiency in subject /course	Sem. Exam.	Assignme	Sem	Work & Sessional	Based Mini Project	ment							(Offline/ Online)	Exam.
1.	DE	DE	Departmental Electron-3 (DE-3)	50	10	20	20		15	*	- i	- 5	100	3	*	-	*	Bleaded (2/1)	79
2	DE*	DE	Departmental Electron 4 (DE-4)				*		7/1	- 36	25	75	100	4	1.5		4	Online (0/2)	MCQ
3.	ос	oc	Oyes Category-2 (OC-2)	50	10	20	20	-			-		100	2	1		3	Bleuded (2/1)	IP.
4	oc	oc	Open Category - 3(OC-3)	50	10	20	30		7/	.5			100	3	3	*	3	Blended (2/1)	pp
5.	120715	DUC	Neliability and Vibration Lab (DLC-4)	100		1.00	-	80	20	20	-		100			4	2	Offline (1/0)	50
6.	120716	DLC	Summer Interecting Project-II (Institute Level) (Evaluation	363	9	×	×	60	40	æ	×	14	100	(4)		4	2	Offline	so
7,	120717	DLC	Ciwitine Problem Solving (DUC-7)	120		- 2	- 2	50	20	20	- 2	- 1	100		-	2	1	Offline	30
		Tel	tal	200	40	50	50	180	80	40	15	75	500	9	1	10	15		

shtaining Honors Minor Specialization by desirous students

Basic of Finite Element

Fluid Dynamics Industrial Applications

Solar Energy

Introduction to Composites

MADRAY INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute& NAAC Accredited Institute Affiliated to RCPV, Bhopal, MP)

Department of Mechanical Engineering Scheme of Evaluation

For batch admitted in Academie Session 2020-2023

B.Tech. (Mechanical Engineering) VIII Semester

5.	Subject	Category	Subject Name				daximum b	facts /	Allotted						bati				
No	Code	Code			Theory S	lot			Practical S	let	MO	OC:			wee!			Mode of	Mode
				End	Sem.	Mid	Quiz/	End	Lab	Skall	Assign	Exem.	Total	E.	T	P	Total Credit	Teaching	nf
				End Term Evaluation	Proficienc y in subject /course	Sem. Exam.	Assignm	Sen	Work & Sessional	Based Mini Project	ment		Marks				Credit	(Office)	Exam
1	DE-	DE	Departmental Electro 4* (DE-4)	- 11	181			is.	lit.	-	25	75	100	3		-	3	Onlane (0/3)	38CQ
3	O+C*	ос	Open Category - 41 (OC-4)	- 6	*					*	25	75	100	3			3	Online (0/3)	MCQ
4	1:0811	DLC	Internalip/ Project (DLC-8)	5)				250	150	-		- 8	400	-		18	9	Interactive	so
5.	120812	PD	Professional Development	20	- V	14	2	-	50	2	- 1	- 21	50	-		4	2	Interactive	50
		Tota	i											6	-	22	17		
	obta	ining Hou	Additional Co		rous students		Per	mitted	to opt for m	simum tu	ro addition	sal course	for the a	ware	of I	Ionos	urs or Min	or specializari	on.

"All of these courses will can though SWAYAM 'NPTEL' MOOC/COURSERA'
"Trailation will be based on participation linearly brought by the students to the arcti-

on in unbound this local technical and other events throug the compilete tenure of the UG program (participation in professional chapter activities est activities, rollaborative events, 5500C; &

		DE-6*		Open Ca	tegory (OC-1)*	Open Category (DC-8)*				
156	Subject Clade	Subject Street	55%.	Subject Codie	Subject Proper	136	Saliger Code	Subject Frame		
1	120861	Quality Design and Control	1		Waite to Energy Convension	1		Mediatrosico		
2	1208-62	Robotics: Basics and Selected Advanced Concepts	2		Probact Design and Manufacturing	2		Elements of Solar Energy Conversion		
3	120963	Steam and Gas Power Systems			Astropatic Control	,		Traditional and Non-Traditional Optimization		



OLD SYLLABUS (2019-23)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) Department of Mechanical Engineering

For batches admitted in Session 2019-20 120304: Fluid Mechanics and Hydraulic Machines

Category	Title	Code	C	redit	-4	Theory Paper
Departmental Core-DC	Fluid Mechanics and Hydraulic	120304/190304	L	Т	P	Max.Marks-70 Min Marks-22
Core-DC	Machines		3	-	2	Duration-3hrs.

Course Objectives: To make the students understand:

Course Objectives: To make the students understand:

1. Fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, Gas dynamics etc.

2. And give fundamental knowledge of fluid, its properties and behavior under various

conditions of internal and external flows.

And develop understanding about hydrostatic law, principle of buoyancy and stability
of a floating body and application of mass, momentum and energy equation in fluid flow.

Course Pre-Requisite: Basic Mechanical Engineering. (Subject Code – 100204)

Unit-I Properties of fluid: Pressure, density, specific weight, viscosity, dynamic and kinematic viscosity Newton's law

Unit-1 Properties of Huta: Pressure, density, specific weight, viscosity, dynamic and Rimematic viscosity Newton's law of viscosity and its applications.

Fluid Static: Pressure variation with depth, pressure measurement, pressure on immersed surface centre pressure, Buoyaney, floatation, stability of floating bodies.

Unit-II Fluid Kinetics: One dimensional flow approximation, control volumes concept, continuity equation in 3-D, its

differential and integral form, velocity and acceleration of fluid particle, stream line, path line. Rotation, vorticity and circulation. Stream function and velocity potential function. Flow net, Free and forced vortex flow.

Unit-III Fluid Dynamics: Momentum theorem, Impulse momentum equation and its plication, Euler's equation in 3-D. Bernoulli's equation for incompressible fluid flow, engineering applications of energy equation, Pitot -Tube, Venturi meter, Orifice meter.

meter, Orlice meter.

Unit-IV Flow through Pipes: Critical Reynolds's number, velocity distribution in pipes, friction factor. Moody's chart, Laminar flow through pipe, Hagen-Poiseulli's equation, Turbulent flow through pipe, Hydraulic gradient line and total energy line. Minor head losses in pipes, Pipe Networking and Transmission of power through pipes.

Unit-V Water Turbine: Impulse and Reaction principles, Pelton, Francis and Kaplan turbines, velocity diagrams, Work

done by turbines. Draft Tube theory.

Course Outcomes: After successful completion of this course students will be able to:

- CO1: Define the fundamental properties of fluids.
- Relate the concepts of mechanics with various laws of fluid mechanics CO2:
- CO3:
- **Identify** the laws of fluid mechanics applicable for the body in various fluids under different conditions. **Analyse** various forces and their effects, related to fluids mechanics.
- COS Measure and compare losses in different fluid flow conditions
- Compare different turbo machines depending on their behaviour and their merits and demerits

- Text & Reference Books:

 1. Fluid Mechanics by Streeter & Wylis; McGraw-Hills Pub.

 2. Fluid Mechanics by Modi& Seth; Standard publishing house.
- Fluid Mechanics by D.S. Kumar ;Katson publisher. Fluid Mechanics by R.K. Bansal; Laxmi Publishing House



REVISED SYLLABUS (2020-24)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALJOR

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

Department of Mechanical Engineering

For batches admitted in Academic Session 2020-21

Fluid Mechanics and Hydraulic Machines

	Category	Title	Code	C	redi	t-4	Theory Paper
	Departmental Core-DC	Fluid Mechanics and	120314/190314	L	T	P	Max.Marks-50 Min.Marks-16
-1	Core-DC	Hydraulic Machines		2	1	2	Duration-3hrs

Course Objectives: To make the students understand:

- 1. Fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, Gas dynamics etc.
- And give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.

Unit-I Properties of fluid: Pressure, density, specific weight, viscosity, dynamic and kinematic viscosity Newton's

law of viscosity and its applications.

Fluid Static: Pressure variation with depth, pressure measurement, pressure on immersed surface centre pressure, Buoyancy, flotation, stability of floating bodies.

Unit-II Fluid Kinetics: One dimensional flow approximation, control volumes concept, continuity equation in 3-D,

its differential and integral form, velocity and acceleration of fluid particle, stream line, path line. Rotation, vorticity and circulation. Stream function and velocity potential function. Flow net. Free and forced vortex flow. Unit-III Fluid Dynamics: Momentum theorem, Impulse momentum equation and its application, Euler's equation is 3-D, Bernoulli's equation for incompressible fluid flow, engineering applications of energy equation, Pitot Tube.

Venturi meter, Orifice meter

Venturi meter, Orifice meter,

Unit-IV Flow through Pipes: Critical Reynolds's number, velocity distribution in pipes, friction factor. Moody's chart, Laminar flow through pipe, Hagen-Poiseulli's equation, Turbulent flow through pipe, Hydraulic gradient line and total energy line. Minor head losses in pipes, Pipes, Pipe Networking and Transmission of power through pipes.

Unit-V Water Turbine and Pump: Impulse and Reaction principles, Pellon, Francis and Kaplan turbines, velocity diagrams, Work done by turbines, Draft Tube theory. Application of dimensional analysis, similarity to turbines and pumps, Classification, advantage over reciprocation type, definition of manometric head gross head, static head, vector diagram and work done. Performance and Characteristics of turbines and pumps.

Course Outcomes: After successful completion of this course students will be able to:

- CO1: Define the fundamental properties of fluids.
- CO2: Relate the concepts of mechanics with various laws of fluid mechanics.CO3: Identify the laws of fluid mechanics applicable for the body in various fluids under different conditions.
- Analyse various forces and their effects, related to fluids mechanics
- CO5: Measure and compare losses in different fluid flow conditions.
- CO6: Compare different turbo machines depending on their behaviour and their merits and demerits

Text & Reference Books:

- Fluid Mechanics by Streeter &Wylis; McGraw-Hills Pub.
 Fluid Mechanics by Modi& Seth; Standard publishing house.
 Fluid Mechanics by D.S. Kumar ; Katson publisher.
 Fluid Mechanics by R.K. Bansal; Laxmi Publishing House.
 Fluid Mechanics by Wyunus A Cengel& John M. Cimbala; Tata McGraw Hill Edition.

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)
Department of Mechanical Engineering
For batches admitted in Session 2019-20

Engineering Thermodynamics

Category	Title	Code	Credit-4			Theory Paper	
Departmental Core-DC	Engineering	120404/190403	L	T	P	Max.Marks-70 Min.Marks-22	
	Thermodynamics		3	1	-	Duration-3hrs.	

Course Objective: To make students able to:

- . Understand the nature and role of the various thermodynamic properties of matter.
- Represent a thermodynamic system by a control mass or control volume and identify work and/or heat interactions between the system and surroundings.

Syllabus

Unit-I Basic Concepts: Thermodynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, Statement and significance, Concept of an Ideal gas, Gas Laws, Avogadro's Hypothesis, Heat and work transfer. First law of thermodynamics –Statement of first law of thermodynamics, first law applied to closed system undergoing a cycle, Process analysis of closed system flow process, Flow energy, Steady flow process analysis of closed system processes. Limitations of first law of thermodynamics.

Unit—II Properties of pure substances: P-V-T surfaces, h-s, T-S, P-V, P-h, T-V diagrams of pure substance, saturated and sub-cooled liquid, superheated vapour, quality of steam, Mollier diagram, steam table, different processes, measurement of quality of steam

Unit—III Second law of thermodynamics: Heat engine, Heat reservoir, Refrigerator, Heat pump, COP, Camot's theorem, Camot's cycle, Efficiency of Camot's cycle, Statement of second law, Reversible and Irreversible processes, Consequences of Second law.

Unit -IV Availability and Irreversibility: Entropy, Entropy change of Ideal gas, Available energy, T-S diagram, Availability and Irreversibility.

Unit- V Thermodynamics Relations: Thermodynamics relations, e.g Maxwell relations and their applications.

Course Outcomes: After successful completion of this course students will be able to:

CO1: Define energy interactions between system and surroundings.

CO2: Correlate the law of thermodynamics to real life applications

CO3: Apply the laws of thermodynamics to analyze boilers, heat pumps, refrigerators, heat engines, compressors and nozzles

CO4: Investigate the effectiveness of energy conversion device in mechanical power generation

CO5:.Analyze air standard cycles applied in prime movers.

CO6: Describe benefits of improvements to thermodynamic systems.

Text & Reference Books:

- 1. Engineering thermodynamics by P.K. Nag
- 2. Thermal engineering by R.K. Rajput
- 3. Thermal engineering by P.L. Ballaney



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Department of Mechanical Engineering For batches admitted in Academic Session 2020-21

Engineering Thermodynamics

Category	Title	Code		redit	t-3	Theory Paper
Departmental	Parada and a	120414/	L	T	P	Max.Marks-50
Core-DC	Engineering Thermodynamics	190413	2	1	-	Min.Marks-16
	Thermodynamics	200000000000000000000000000000000000000	1000	10.50		Duration-2 hrs.

Course Objective: To make students able to:

- Understand the nature and role of the various thermodynamic properties of matter.
- Represent a thermodynamic system by a control mass or control volume and identify work and/or heat interactions between the system and surroundings.

Syllabu

Unit-I Basic Concepts: Thermodynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, Statement and significance, Concept of an Ideal gas, Gas Laws, Avogadro's Hypothesis, Heat and work transfer. First law of thermodynamics - Statement of first law of thermodynamics, first law applied to closed system undergoing a cycle, Process analysis of closed system flow process, Flow energy, Steady flow process analysis of closed system processess. Limitations of first law of thermodynamics.

Unit —II Properties of pure substances: - P-V-T surfaces, h-s, T-S, P-V, P-h, T-V diagrams of pure substance, saturated and sub-cooled liquid, superheated vapour, quality of steam, Mollier diagram, steam table, different processes, measurement of quality of steam

Unit —III Second law of thermodynamics: Heat engine, Heat reservoir, Refrigerator, Heat pump, COP, Carnot's theorem, Carnot's cycle, Efficiency of Carnot's cycle, Statement of second law, Reversible and Irreversible processes, Consequences of Second law.

Unit -IV Availability and Irreversibility: Entropy, Entropy changes of Ideal gas, Available energy, T-S diagram, Availability and Irreversibility.

Unit-V Thermodynamics Relations: Thermodynamics relations, e.g. Maxwell relations and their applications. Air Standard Cycles: Carnot. Sterling, Eriession, Otto, Diesel, Dual cycles and determination of their air standard efficiencies and their comparison. Brayton cycle, Atkinson cycle, PVT relationship, Mixture of ideal cases Properties of mixture of cases.

Course Outcomes: After successful completion of this course students will be able to:

CO1: Define energy interactions between system and surroundings.

CO2: Correlate the law of thermodynamics to real life applications

CO3: Apply the laws of thermodynamics to analyze boilers, heat pumps, refrigerators, heat engines, compressors and nozzles

CO4: Analyze the thermal efficiency of air standard cycles

CO5: Analyze the entropy concept in thermodynamic systems.

CO6: Describe benefits of improvements to thermodynamic systems.

Text & Reference Books:

- 4. Engineering thermodynamics by P.K. Nag
- 5. Thermal engineering by R.K. Rajput
- Thermal engineering by P.L. Ballaney



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For batches admitted in Session 2019-20

Industrial Engineering

Category	Title	Code	Credits: 3			Theory Paper	
Departmental Core-DC	Industrial Engineering	120501/190501	L	Т	P	Max.Marks-70 Min.Marks-22	
Core-DC	Engineering		-	-	+	Min.Marks	

Course Objectives: To make the students understand:

- Professional, technical managerial, or leadership roles within industrial organizations.
- The knowledge through discovery, synthesis, and integration for the betterment of their organization or

Syllabus

UNIT-I

Production Systems and Productivity: Production Management: design of production systems (product, job shop and batch). Definition and types of productivity, Measurement of productivity, factors affecting the productivity and productivity improvement programs.

Production Planning and Control: Objective, importance, need and function of production planning and control,

planning, routing, scheduling, dispatching, follow up & progress report, production planning and production control

Forecasting techniques: Need and type of forecasting, factors affecting forecasting, forecasting in decision making, time series analysis, demand patterns, qualitative methods- measures of forecast accuracy and error

analysis in quantitative forecasting.

Capacity and aggregate planning: Capacity planning: capacity measurement, long-term and short-term strategies, aggregate production planning, and graphical method to choose aggregate plan.

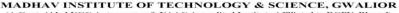
Inventory Control - Objectives and functions, need and classifications- codification and standardization ABC analysis, deterministic inventory models, quantity discount; perpetual and periodic inventory control systems Probabilistic inventory management, economic ordering quantity procurement cost, carrying charges, lead-time,

Project management - PERT and CPM.

UNIT-IV

Product Design and Development: Principles of good product design, tolerance, quality and cost considerations, product life cycle, standardization, simplification, diversification, value engineering and analysis, methodology, applications, concurrent engineering; comparison of production alternatives. Facility Locations and Plant Layout: Facility location factors and evaluation of alternate locations; qualitative aspects, quantitative models for layout decisions, types of plant layout and their evaluation; computer aided layout design techniques; assembly line balancing, materials handling systems

Master Production Scheduling and MRP: Functions, planning horizon and planning periods for master production schedule, types of master production schedule, Bill of Material, Independent Demand versus dependent demand, Functions of material requirements planning and manufacturing resource planning (MRP I and MRP II), inputs for MRP system, performance characteristics of MRP system, materials requirement planning explosion.



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Department of Mechanical Engineering

For batches admitted in Academic Session 2020-21

190511/120511: Industrial Engineering

Category	Title	Code	Cre	dits:	2	Theory Paper
Departmental	Industrial	190511/120511/	L	T	P	Max.Marks-50
Core-DC	Engineering	190501/120501	2	-	-	Min.Marks-16 Duration-2hrs.

Course Objectives: Industrial engineering is concerned with the design, improvement, installation, and management of integrated systems of men, material, and machine. After completing this course, students will learn a set of skills that includes mathematical modeling, probability and statistics, computer science, human factors, interpersonal skills, project management, and an ability to manage and administer large technical engineering and research projects. Thus, industrial engineering may be thought of as applied problem-solving, from inception to implementation.

Syllabus

Production Systems and Productivity: Production Management: design of production systems (product, job shop and batch). Definition and types of productivity, Measurement of productivity, factors affecting the

productivity and productivity improvement programs.

Production Planning and Control. Aggregate production planning. Capacity planning: capacity measurement, long-term and short-term strategies, aggregate production planning, and graphical method to choose aggregate

Forecasting techniques: Need and type of forecasting, factors affecting forecasting, forecasting in decision making, time series analysis, demand patterns, qualitative methods- measures of forecast accuracy and error analysis in quantitative forecasting.

UNIT-III

Inventory Control - Objectives and functions, need and classifications- codification and standardization ABC analysis, deterministic inventory models, quantity discount; perpetual and periodic inventory control systems. Probabilistic inventory management, economic ordering quantity procurement cost, carrying charges, lead-time, reorder point

Unit-IV

Facility Locations and Plant Layout: Facility location factors and evaluation of alternate locations; qualitative aspects, quantitative models for layout decisions, types of plant layout and their evaluation; computer aided layout design techniques; assembly line balancing, materials handling systems.

Project management - Project Scheduling, Network diagram, critical path method (CPM), Project Evaluation and review techniques (PERT). Time cost trade off.

UNIT-V

Master Production Scheduling and MRP: Functions, planning horizon and planning periods for master production schedule, types of master production schedule, Bill of Material, Independent Demand versus dependent demand, Functions of material requirements planning and manufacturing resource planning (MRP I and MRP II), inputs for MRP system, performance characteristics of MRP system, materials requirement



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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For batches admitted in Session 2019-20

120504: Thermal Engineering

Category	Title	Code	(redit	-4	Theory Paper
Departmental Core- DC	Thermal Engineering	120504	L	T	P	Max.Marks-70 Min.Marks-22
be	Lingmeering		2	1	2	Duration-3hrs.

Syllabus

UNIT I -Air Standard Cycles and Vapor Power Cycles: Carnot, Sterling, Ericssion, Otto, Diesel, Dual cycles and determination of their air standard efficiencies and their comparison. Brayton cycle, Ackinson cycle-PVT relationship, Mixture of ideal gases Properties of mixture of gases. Vapor Carnot cycle and is limitations, Rankine cycle, actual apport power cycle. Reheat cycle, ideal regenerative cycle, actual regenerative cycle, Reheat – regenerative cycle, feed water heaters, working fluids in vapor power cycle, binary vapor cycles, efficiency of coupled cycles, process heat, efficiencies in power cycles. Basics of condensers.

UNIT II - Engine Construction, Operation and Performance:

Basics of CI and SI Engines, Valve timing diagram, Firing order and its significance - relative merits and demerits of SI and CI engines. Two stroke engine construction and operation. Comparison of four-stroke and two-stroke engines. Performance parameters, Heat balance. Testing of engine.

UNIT III - Combustion in SI and CI Engines:

Combustion process in IC engines. Stages of combustion, Flame propagation, velocity and area of flame front. Rate of pressure rise - Cycle to cycle variation - Abnormal combustion - Theories of detonation - Effect of engine operating variables on combustion. Combustion chambers for SI and CI engines, Importance of air motion - Swirl, squish and turbulence - Swirl ratio. Fuel air mixing - Stages of combustion - Delay period - Factors affecting delay period, Knock in CI engines - methods of controlling diesel knock.

UNIT IV - Turbines and Pumps

Classification, Pelton, Francis and Kaplan turbines, vector diagrams and work done Draft Tubes, governing or water turbines, Impulse staging, velocity and pressure compounding utilization factor, analysis for optimum U.F. Curtis stage, and Rateau stage, including qualitative analysis. Effect of blade and nozzle losses on Vane efficiency, Stage efficiency. Analysis for optimum efficiency vortex types of flow, flow with constant reaction. Application of dimensional analysis, similarity to turbines and pumps, Classification, advantage over reciprocation type, definition of manometric head gross head, static head, vector diagram and work done. Performance and Characteristics of turbines and pumps.

Unit V Refrigeration and Air Conditioning

Reversed Brayton Cycle, Bell-Coleman Cycle.Air Cycles for Aircraft Refrigeration, Properties Requirement, & Applications of Refrigerants.CFC & HFC Refrigerants.Simple vapour Absorption Systems-Electrolux Refrigerator, Refrigerants, Ozone depleting refrigerants.

Vapour Compression System: Simple Systems, Multi pressure systems. Compound Compression, Multi Evaporator Systems. Cascade Systems. Vapour absorption system.

Air Conditioning: Introduction to Psychometry and Air Conditioning.



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of Mechanical Engineering 120514: Thermal Engineering

Category	Title	Code	(Credits	-4	Theory Paper
Departmental	Thermal	120514	L	T	P	Max.Marks-50 Min Marks-16
Core-DC	Engineering		2	1	2	Daniel 2 h

Course Objectives: To make the students understand:

- 1. the fundamental principles of IC engines and combustion phenomena
- 2. the basic principles of nozzles and diffusers
- the application of basic thermodynamics and fluid mechanics in steam and gas turbine power

UNIT I - Vapor Power Cycles: Vapor Carnot cycle and its limitations, Rankine cycle and modified Rankine cycle, actual vapor power cycle, Reheat cycle, ideal regenerative cycle, actual regenerative cycle, Reheat regenerative cycle, feedwater heaters, cogeneration of power and process heat, working fluids in vapor power cycle, binary vapor cycles, the efficiency of coupled cycles. Basics of condensers.

UNIT II - IC Engine Basics and Combustion in IC Engines

Basics of CI and SI Engines, Basics of two-stroke and four-stroke IC engines, Valve timing diagram, Performance parameters, Heat balance, Testing of the engine.

Stages of combustion in SI engine, Flame propagation, Rate of pressure rise, Abnormal combustion, Theory of detonation, Effect of engine operating variables on knock, Stages of combustion in CI engines, Delay period - Factors affecting delay period, Knock in CI engines - methods of controlling diesel knock, Combustion chambers for SI and CI engines.

UNIT III - Gas Turbine

ONTI III — Gas Turbine
Open cycle and closed cycle arrangements, applications, assumptions in ideal cycle analysis, simple gas turbine cycle, heat exchange cycle, intercooled cycle, various combinations of reheat, heat exchange and intercooling, comparison of various cycles, Combined Brayton and Rankine Cycle and GT-ST plants; Advantages of

UNIT IV - Steam Turbines

CNITY—Steam Turbines.

Classification of steam turbine, Impulse and reaction turbines, Staging, Stage and overall efficiency. Reheat factor, Utilization factor, Blading, Velocity diagram & work calculations, Impulse Reaction Turbines, Losses in steam turbines, Governing of turbines.

Introduction, SFEE and continuity equation for nozzles & diffusers, momentum equation for the steam nozzle, introduction, SFLE and continuity equation for nozzles & diffusers, momentum equation for the steam nozzle, entropy change due to friction in the nozzle, nozzle efficiency, critical pressure, stagnation enthalpy & pressure, Relation between area, velocity & pressure in nozzle, the effect of friction on critical pressure ratio, supersaturated flow in nozzles, the effect of variation of back pressure

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