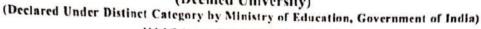
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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed University)





NAAC Accredited with A++ Grade
Department of Mechanical Engineering

Dan 577 06/02/2025

(II SEM 2024 admitted batch)

Board of Studies Proceeding

Online Meeting Dated: 06/12/2024

Department of Mechanical Engineering

Dept. of Mechanical Engg.

BoS dated: 06/12/2024



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (Deemed University)



(Declared Under Distinct Category by Ministry of Education, Government of India)

NAAC Accredited with A++ Grade

Department of Mechanical Engineering

Minutes of Board of Studies Meeting held on 06th December, 2024

The meeting of Board of Studies (BoS) of the Mechanical Engineering was held on 06th December, 2024 at 12:30 PM onwards in online mode. Following members were present

1. Dr. C. S. Malvi

(Chairperson, BoS and Head, Dept. of Mech. Engg. MITS-DU)

2. Dr. B. B. Panigrahi

(Professor, IIT, Hyderabad, External Expert)

3. Dr. Mukul Shukla

(Professor, IIT, Hyderabad, External Expert)

4. Dr. Pratesh Jayaswal

(Professor, Mechanical Engg. MITS, Member)

5. Dr. M. K. Gaur

(Professor, Mechanical Engg. MITS, Member)

6. Dr. M. K. Sagar

(Professor, Mechanical Engg. MITS, Member)

7. Prof. R. P. Kori

(Astt. Prof., Mechanical Engg. MITS, Member)

Prof. V. Chaturvedi

(Astt. Prof., Mechanical Engg. MITS, Member)

Dr. Jyoti Vimal

(Astt. Prof., Mechanical Engg. MITS, Member)

Instructions for preparing BoS Proceedings

[All information is to be uploaded on the webpage under suitable heading (such as Board of Studies) and separate links to be provided for each category mentioned below)

Minutes should have a summary/cover page mentioning all the significant changes made in the following

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ì	given format :		Courses	where revis	sion was carr	ied out		00	T_ +6.1a_	
	(Course name)	Course Code	Year/Date of introduction	Year/Date of revision	Percentage of content added or replaced	Item	Page No.	Link docum	of ents/π	relevant
ŀ				N	IL					

		New Courses added					
(Course name)	Course Code	Activities/contents which have a bearing on increasing skill and employability	Agenda Item No.	Page No.	Link docume	of ents/m	relevant inutes
		NIL					

^{*} Separate page(s) for each of the above points; Agenda point wise minutes to be appended with each point and a separate link to be given in the appropriate column for each point

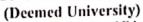
Dept. of Mechanical Engg.

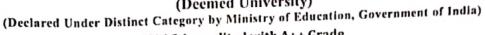
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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR







NAAC Accredited with A++ Grade **Department of Mechanical Engineering**

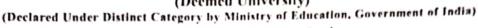
			BoS A	genda Items	
	To confirm	n the minutes of	. D.C mac	ting held in the month of September 2021.	ned &
ITME	The endounts	af the last RoS h	eld on 12th Septemb	er 2024 were confirmed. The BoS Minutes were presen	
MEI	The minute	Academic Counci	l.		
				itch admitted in 2024-25 academic session und Deemed University (MITS-DU) structure.	er inc
	To review	the scheme str	ucture for the Ba	Deamed University (MITS-DU) structure.	
	Madhay Ir	istitute of Techno	ology & Science .	to beginnering for the	batch
	The prope	seed Scheme str	ucture of B.Tech	i. II Semester Mechanical Engineering for the der the Madhav Institute of Technology & Scipresented and discussed in the meeting.	ence-
	admitted	n 2024-25 acad	lemic session un	der the Madhay Institute of Teemhology	
	Doomed I	Iniversity (MITS	-DU) offered was		7
	Decined C		Category Code	Course	-
	5. No.	Course Code	DC	Engineering Graphics	-
1	1.	12241201	DC	Engineering Thermodynamics	1
1	2.	12241202 12241203	DC	Engineering Mechanics Metal Cutting & Machine Tools	
ITEM	3.	12241204	DC	Matrix. Differential Equations and Vector Calculus	
ME2	5.	12241205	BSC	Cagingaring Grannics Lab	-
WILL	6.	12241206	DLC	Broblem Solving through Python Programming	-
- 1	7.	12241207	DLC SP	Convertor Proffciency	\dashv
1	8.	12241208	PBL	Micro Project-II" (Metal Cutting & M/c Tools)	1
1	9.	12241209 12241210	ESC	Engineering Physics Lab ³³ Language Lab	7
I	10.	12241211	HSMC	Novel Engaging Course (Activity Based Learning)	
- 1	11.	NECXXXXX	NEC	Cual Internship Program (Son Skin)	4
IF	13.	SIPIXXXX	SIP	tities & Environmental Science	-
		12241212	MAC	Statement of the state Costom at	
- 1	14.			Workshop on Indian Knowledge System at	1
		10041012		Mandatory Workshop on Indian Knowledge System at	tod in
	15.	12241213	MWS	Mandatory Workshop on Indian Knowledge System Department Level (Duration: Two Days) June Of B. Tech. II Semester (for batch admit	ted in
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Dept. of Mechanical Engg.

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Department of Mechanical Engineering

ITEM ME5	along with their Course Outcomes (COs)
ITEM ME6	N/A To review and finalize the syllabus/module of Classified Novel Engaging Course to be offered in II semester of PG programme The following course will be offered as classified Novel Engaging Course in I sem. PG Program 1. Research Management The syllabus/Module for this course was finalized and discussed in the Meeting.
ITEM ME7	Any other Matter N/A

Dr. Jyoti Vimal (BoS Member)

Dr. M. K. Gaur (BoS Member) Mr. V. Chaturved (BoS Member)

Dr. Pratesh Jayaswal (BoS Member) Mr. R. P. Kori (BoS Member)

Dr. Mukul Shukla (External Expert) Dr. M. K. Sagar (BoS Member)

on the fresent Dr. B. B. Panigrahi (External Expert)

Dr. C. S. Malvi (BoS Chairman)

Dean

Faculty of Engineering & Technology MITS-DU



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (Deemed University)

(Declared Under Distinct Category by Ministry of Education, Government of India) Department of Mechanical Engineering NAAC Accredited with A++ Grade



To review the scheme structure for the Batch admitted in 2024-25 ME2 academic session under the Madhav Institute of Technology & Science-



(Deemed University)

(Declared Under Distinct Category by Ministry of Education, Government of India)

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Department of Mechanical Engineering Scheme of Evaluation

Course Catego Code Code Code Code Code Code Code Cod	tego T			TAT	Maximum Marks Allotted	rks Allotte	p			Cont	Contact Hours	Y			
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		Course Name	Cont	ontinuous Evaluation	uation		Continuous		Total			H C	Tetal Mode	Mode of Major	
			Minor Evaluation	Minor Evaluation II	Quiz/ Assignment	Evaluation	1	Major Evaluation		۵	-	04	Learning	P.Villaution	n Evaluation
	DC	Engineering Materials	20	20	3.0	30	-		100	1			Tanada Par		2 Mee
	ESC	Consputer Programming	20	30	30	OE			100		1		ì		A 150
	DC	Manufacturing Science	20	20	30	30			1000	4 .			race to race		2 PSS
	DC	Basic Mechanical Engineering	20	36	300	20		45	NI S	4 1		**	Face to Face		2 Hrs
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1d 6011160	PBL	Micro Project-I" (Manufacturing Scunce-Workship)	-	14	4	,	10	3.0	100			-	Enterinetial		
12241110 E	ESC	Engineering Chemistry Lab"					7.0	20	100		1	1 1	CAPCHOLOGIC		1
N XXXXXXX	NEC	Novel Engaging Course (Activity Based Learning)					03	-	200		1	u	- cyperimental	1	4
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(224TI) M	MAG	A HVFL.	20	20	30	30		,	100	2	*	- GR	GRADE Stended	MCO	1.5 Hes
Mainz M	SARR	5. 19112 When they Merkelop on Indian Constitution and Traditional Knowledge at Department I and (Duration: Two Days)	raditional Kr	wwterlige at D	epartment Levi	of Churation:	Two Days)					GR	GRADE Interactive	MCG	

Skill Internship Program (Soft Skill); Minimum 45 hours duration: To be credited in II Semester. Senester Protectercy—unstudes the weightage towards ability/ skill competency /knowledge level /expertise attained etc. in the sentester courses MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

MCQ: Multiple Choice Question AO: Assignment - Oral PP: Pen Paper SO: Submission + N This course will be distributed in the I Year Group wise among the programmes where ever required to the programme subsequence of the programmes where ever required to the programme subsequence of the programmes where ever required to the programmes are programmed to the programmes and the programmes are programmed to the programmes and the programmes are programmed to the programmes and the programmes are programmed to the programmes are programmed to the programmes are programmed to the programmes and the programmes are programmed to the programme

ESC DC DLC NEC men project evalua-

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	-80	3	15.70%		
	OB				
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	- dd	9	31.587/4		9
	Experimental	3	15.19%		
Lab	Experiential	-	5.26%	Y	الم
	Blended				
NEC	Interactive	-	5.26%		
Proficiency	Face to Face.	-	16%	8	
	Octine				
Theor	Face te	13	68.91%		

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Department of Mechanical Engineering Scheme of Evaluation

				B. Tecl	1. II Semo	ester (Me	chanical I	B. Tech. II Semester (Mechanical Engineering)		for batc	h ac	lmitt	ted in	r acade	(for batch admitted in academic session 2024-25	on 20.	24-25
					M	aximum M	Maximum Marks Allotted	pa		Ī	Conta	Contact Hours	Sin				
					Theor	Theory Block	and the second	Practical Block	Block		be	per week	,		-		
S. No.	Code	Code	Course Name	Cont	Continuous Evaluation	ation		Continuous		Total				Total		Mode of Major	Duration
				Minor Evaluation 1	Minor Evaluation II	Quiz/ Assignment	Major Evaluation	Lab Work & Sessional	Major			н	۵.		Learning	Evaluation Evaluati	Evaluati
1.	12241201	DC	Engineering Graphics	20	20	30	30			100	7	-		3	Face to Face	dd	2 Hrs
7.	12241202	DC	Engineering Thermodynamics	20	20	30	30			100	2	-		3	Face to Face	MCO	2 Hrs
3.	12241203	DC	Engineering Mechanics	20	20	30	30			100	2			3	Face to Face	MCO	2 Hrs
Ť	12241204	DC	Metal Cutting & Machine Tools	20	20	30	30			100	2	-	,		Face to Face	MCO	2 Hrs
wi	12241205	BSC	Matrix, Differential Equations and Vector Calculus	20	20	30	30			100	m		4		Face to Face	PP	2 Hrs
6.	12241206	DIC	Engineering Graphics Lab	(4)	6			7.0	30	100			2	-	Experimental	AO	
7.		DIC	Problem Solving through Python Programming					. 04	30	100	1.0	4	2	-	Experimental	VO	1
œ	12241208	SP	Semester Proficiency ⁵					90		20	3	100	ri	-	Face to Face	SO	,
.6		PBL	Micro Project-II" (Metal Cutting & Mc Tools)					20	30	100	,		2	-	Expenential	SO	
10.		ESC	Engineering Physics Lab**	190				20	30	100			2	1	Experimental	OV	
=	L 12241211	HSMC	Language Lab	9)				02 -	30	100	1		2	1	Blended	AO	-
12	2. NECKYKKK	NEC	Novel Engaging Course (Activity Based Learning)					80		50			9	-	Interactive	So	
13	3. SPHYTELL	SIP	Skill Internship Program (Soft Skill)					09	- 0.0	09	10	1		200	Expenential	SO	
			Total	100	100	150	150	510	150	1160	11	0.5	12	24		.1	-
	14, 12241713	MAG	Sustainability & Environmental Science	20	20	30	30		,	100	P.1.	A	4	GRADE	Blended	MCO	1.50
	15 12241213	MINS	Mandatory Workshop on Indian Knowledge System at Department Level (Duration: Two Days)	em at Depar	tment Level ()	Duration: Tw	(virg)							GRADE	Interactive	NCO	

Summer Semester of six-eight weeks duration will be conducted for makeup of 1 & 11 semester examination Semester Proficiency- includes the weightage towards ability/ skill/ competency /knowledge level/expertise attained etc. in the semester courses OB: Open Book

SO: Submission + Oral imes where ever required PP: Pen Paper A This course will be distributed in the I Year Group wise among the pro AO: Assignment + Oral MCQ: Multiple Choice Question

be transferred from Skill Internship Program (Soft Skill)

DLC NEC mary project evaluation committee DC BSC HSMC

SIP PBL MAC MWS

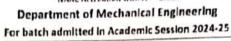
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unimation		OB	*		
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Mode of Learning	NEC	Interactive	1	1940	1
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Faculty of Engineering & Technology MITS-DU

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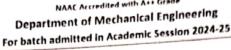


Item
ME3
To review and finalize the syllabi of all courses of B. Tech. II Semester (for batch admitted in 2024-25) under the flexible curriculum along with their COs.



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12241201: Enginee	ering Graphics		Credit-3	Major Evaluation
Category	Title	Code		Max.Marks-30 Duration-2 hrs.
Departmental Core-DC	Engineering Graphics	12241201	2 1 .	

- 1. To inculcate the imagination and mental visualization capabilities for interpreting the geometrical
- 2. To impart knowledge about principles/methods related to projections of one, two and three dimensional objects.

Scale and Spirals: Basics of instruments, Lettering and dimensioning, Plane geometrical constructions. Plain and diagonal scale - Representative fraction, Unit conversion and Exercises based on linear, area, volume, Archimedean and logarithmic spiral curves.

Projection of points: Introduction, types of projections, quadrant system, positions of points and

Projection of straight line: Introduction, Orientation of a straight line, Traces of a line and Exercise.

Projection of planes: Introduction, Types of planes, Traces of planes, Position of planes and Exercise.

Projection of solids: Introduction, Types of solids, Positions of solids and Exercise.

Section of solids: introduction, Types of section planes and Anti-section and Exercise.

Development of surfaces: Introduction, Methods of development of Prism, Pyramid, Cone, Cylinder.

Isometric projections: Introduction, isometric scale, isometric axis, isometric view and isometric projections from orthographic views, orthographic views from pictorial view and exercise. Computer Aided Drafting using Auto CAD: Introduction, software's basic commands, transformation and editing

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

CO1. Draw plain, diagonal scale and spirals for given conditions.

CO2. Analyse and represent the positions of points and orientations of straight lines in different

CO3. Interpret and represent the projections of planes and solids in various orientations.

CO4. Create sectional views of solids using appropriate section planes, including anti-sections, and apply various methods to develop the surfaces.

CO5. Develop the ability to create isometric projections and views of 3D objects using isometric scales and auto CAD.

Course Articulation Matrix

				,	-	Territ	10/17	POS	PO9	PO10	POH	PO12	PSO1	PSC
	POI	PO2	PO3	PO4	PO5	PO6	PO7	1176	107		-	1	-	1
10	3	3	2	2	1	1	-	1	-	-				+-,
		3	2	2	1	1	-	1	-	-	1	3		-
:02	3	1-3	-	2	1	2	-	1	-	-	1	3	1	2
()3	3	3		-	<u> </u>	1	 	1	-	-	1	3	-	-
04	3	3	2	2	1	<u> </u>		<u> </u>	-	-	1	3	1	2
05	3	3	2	3	3	2	-				•			.1

1 - Slightly; 2 - Moderately; 3 - Substantially





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Department of Mechanical Engineering For batch admitted in Academic Session 2024-25



Text books:

- 1. Engineering Drawing by N. D. Bhatt, Charotar Publication Pvt. Ltd.
- 2. Engineering Drawing by P.S. Gill, S. K. kataria& sons, Delhi
- 3. Engineering Drawing by BasantAgrawal& C. M. Agrawal, Tata McGraw Hill Education Pvt, Ltd.
- 4. Engineering Graphics by K. Venugopal, New Age International Publication, India

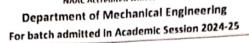
NPTEL Link for Engineering Graphics:

http://nptel.ac.in/courses/112103019/



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12241202: Engineering Thermodynamics

12241202: Engineer	ring Thermodynamic		Credit-3	Theory Major
Category	Title	Code	m D	Evaluation Max.Marks-30
Departmental Core-DC	Engineering Thermodynamics	12241202	2 1 -	Duration-2 hrs.

Course Objective: To make students able to:

- 1. Understand the nature and role of the various thermodynamic properties of matter.
- 2. Represent a thermodynamic system by a control mass or control volume and identify work and/or heat interactions between the system and surroundings.
- 3. Recognize the different forms of energy and restrictions imposed by the laws of thermodynamics on conversion from one form to another.

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,

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,

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

Air Standard Cycles: Carnot, Sterling, Ericssion, Otto, Diesel, Dual cycles and determination of their air standard efficiencies and their comparison. Brayton cycle, Atkinson cycle. PVT relationship, Mixture of ideal gases Properties of mixture of gases.

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

CO1: Describe the basic concepts of thermodynamics, including properties, equilibrium, state, process, and cycle, and explain their significance in analyzing thermal systems.

CO2: Analyze the thermodynamic properties of pure substances using P-V-T surfaces, Mollier charts,

CO3: Analyze the operation and performance of heat engines, refrigerators, and heat pumps, including

their coefficients of performance (COP) and efficiencies. CO4: Apply the concepts of availability and irreversibility to quantify the efficiency losses in practical

CO5: Analyze the performance of Carnot, Stirling, Ericsson, Otto, Diesel, Dual, Brayton, and Atkinson cycles.

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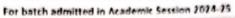
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Course Articulation Matrix

													CHECKET.	PULL
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COL	3	3	3	3	2	1	1	1	-		1	-	-	1
co:	3	,	3	3	2	1	1	1	-		-!		-	1
(())	3	3	3	3	2	2	2	1				,	-	1 -
CO4	3	3	3	3	1	1	1					1	1	1
CO5	3	3	3	3	3	2	2	,						

1 - Slightly; 2 - Moderately, 3 - Substantially

Text & Reference Books:

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

NPTEL Link for Engineering Thermodynamics

https://onlinecourses.nptel.ac.in/noc18 ch03/preview



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12241203: Engineering Mechanics

Category	Title	Code	C	redit		Theory Major Evaluation Max.Marks-30 Duration-2 hrs.		
Departmental	Engineering	12241203	L	Т	P			
Core-DC	Mechanics		2	2 1 -		- Duration-2 ma.		

Course Objective: To make students able to:

- 1. Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
- 2. Correlate real life application to specific type of friction and estimate required force to overcome friction.
- 3. Analyze particles in motion using force and acceleration, work-energy and impulse momentum principles

Unit-I Basic Concepts: Classification of force systems, Principle of transmissibility, composition and force system (Concurrent forces, parallel forces and non-concurrent Non-parallel system of forces). Parallelogram Law of Forces, Moment of force about a point, Couples, Varignon's Theorem.

Unit -II Equilibrium of System: Newton's Laws of motion, D'Alembert's principle. conservative and non-conservative forces, Conditions of equilibrium for concurrent forces, parallel forces and nonconcurring non- parallel forces. Equilibrium of rigid bodies free body diagrams. Lami's Theorem

Unit -III Friction: Characteristics of Frictional Force Static Friction, Dynamic/ Kinetic Friction, Coefficient of Friction, Angle of Friction, Limiting Friction, Angle of repose, Laws of friction. Equilibrium of bodies on inclined plane. Application to ladders problems.

Unit -IV Structure Analysis: Types of beams, types of loading and supports and reaction: Determination of reactions at supports for various types of loads on beams. (Excluding problems on internal hinges) Shear force and bending moment, Trusses: Introduction, Simple Trusses, Determination of forces in simple trusses members, methods of joints and methods of section. Difference between trusses, frames and beams

Unit- V Work and Energy: Work, power, energy, Work Energy principle for a particle in motion. Application of Work - Energy principle Impulse and Momentum: Impulse, Momentum. Coefficient of restitution, Impulse Momentum principle of particle Impact and collision: Law of conservation of momentum, Coefficient of Restitution

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

CO1: Describe the fundamental principles of force systems, including the classification of force systems, principle of transmissibility, and the composition and resolution of forces.

CO2: Illustrate the conditions of equilibrium for various force systems, including concurrent, parallel, and

non-concurrent non-parallel forces, as well as couples CO3: Solve real-world problems involving ladders and other friction-dependent systems."

CO4:Apply the concepts of shear force and bending moment in practical systems and determine of

reactions at supports for various types of loads. CO5: Analyze the concepts of impulse and momentum, including their interrelation through the impulse-

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momentum principle, and solve problems involving dynamic system

Course Articulation Matrix

	POI	PO2	PO3	PO4	PO5	PO6	107	Priv	11/10	04310	1973.1.1	0/112	PSO1	P5O2
COL	3	3	3	3	2			11/0	1109	1010	ron	11712	1.5071	1.30.
(02	3	3	3	1	2	-:-	1	1	-	•	1	3		1
03	3	3	3	3	- 2	1	1	1	•	•	1	3	1	1
.()4	3	2	3	-;-	2	2	2	1		-	1	3	1	2
	-	3	3	3	- 1	1	1	1		-	1	3	•	-
05	3	3	3	3	3	2	2	1	-	-	1	3	1	2

1-Slightly; 2-Moderately; 3-Substantially

Text & Reference Books:

- 5. Engineering Mechanics, by S.S. Bhavi Katti ,New Age Pub.
- 6. Engineering Mechanics, by R.K. Rajput, Laxmi Pub.
- 7. Mechanical Engineering by, S.K. Katarial & Sons
- 8. Engineering Mechanics by Beer & Johnston, Tata McGrawHill

NPTEL Link for Engineering Mechanics

https://archive.nptel.ac.in/courses/112/106/112106286/

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Department of Mechanical Engineering



For batch admitted in Academic Session 2024-25

12241204: Metal Cutting and Machine Tools

Category	Title	Code	C	redit:	3	Theory Major Evaluation	
Departmental	Metal Cutting and	12241204	L	Т		Max.Marks-30 Duration-2 hrs.	
Core-DC	Machine Tools		2	1	-		

Course Objectives: To make the students understand:

- The fundamental knowledge and principles in material removal processes.
- 2. The fundamentals and principles of metal cutting to practical applications through
- 3. The fundamentals of machining processes and machine tools.

Syllabus

Unit-I Mechanics of Metal Cutting: Introduction to manufacturing and machining, Classification of metal removal processes, Geometry of single point cutting tool and tool angles. Tool nomenclature. Conversion of tool angles from one system to another, Mechanics of chip formation and types of chips, chip breakers. Orthogonal and oblique cutting, cutting forces and power required, theories of metal cutting. Thermal aspects of machining and measurement of chip tool interface temperature. Friction in metal cutting. Machinability & Cutting Fluids: Concept and evaluation of machinability, tool life, mechanism of tool failure, tool life and cutting parameters, machinability index, factors affecting machinability. Advanced Cutting Tool Materials, Cutting Fluids

Unit-II General Purpose Machine Tool: Constructional detail of milling, shaper and planer machines. Tooling, attachments and operations performed, selection of cutting parameters, calculation of forces and time for machining. Broaching operation. Capston and turret Lathes, single and multiple spindle

automates, operations, planning and tool layout.

Unit-III Abrasive Processes & surface Finishing: Abrasive, natural and synthetic, manufacturing nomenclature. Selection of grinding wheels, wheel mounting and dressing. Surface Finish: Elements of surface roughness, evaluation and representation and measurement of surface roughness, relationship of surface roughness to production methods.

Unit-IV Gear Manufacturing Processes: Introduction, materials, methods of gear manufacturing, Gear Milling, Gear Hobbing& Gear Shaping Machine Tools and processes. Modern gear manufacturing methods gear inspection.

Unit-V Non-Conventional machining: Benefits, general application and survey of Non-conventional machining processes. Mechanism of metal removal, tooling and equipment and specific applications of EDM, LBM, EBM, ECM, USM, AJM, WJM, AWJM, PAM processes

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

COI: Apply cutting mechanics to metal machining based on cutting force and power consumption.

CO2: Differentiate lathe, milling machines, drill press, grinding machines, etc. according to the operations.

CO3: Analyze abrasive processes, including grinding wheel selection and dressing, and evaluate surface roughness measurement techniques and their relationship to production methods.

CO4: Describe the materials and methods used in traditional and modern gear manufacturing processes.

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CO5: Analyze the benefits, applications, and mechanisms of metal removal in non-conventional machining processes.

Course Articulation Matrix

2012/02/2015								000	non	PO10	PO11	PO12	PSO1	P502
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	FOI	1022		1	1
CO1	3	1	2	1	3	1	1	1	2	1	•	3	1	-
10.5150000		-	-	-	-	•	-	1	1	1	-	3	1	1
CO2	3	1	2	2	3	1				-	2	3	1	2
CO3	3	3	3	2	3	2	1	1	1	1			-	2
	-	2	2	2	3	1	2	1	1	1	2	3	1	
CO4	3	3	3					-	1	1	2	3	1	2
CO5	3	3	3	3	3	2	1	1				3	1	2
CO6	2	3	3	3	3	3	2	3	1	2	2	,		

1 - Slightly; 2 - Moderately; 3 - Substantially

Text Books

- Fundamentals of Metal Cutting and Machine Tool by Boothroyd Geofery; McGH, Kogakuha Ltd.
- . 2. Production Technology by Jain, R.K. and Gupta, S.C; Khanna Publishers.

Reference Books:

- 1. Workshop Technology by Chapman, Volume I, II, & III, ELBS.
- 2. Production Technology by HMT; McGraw Hill, New Delhi.

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12241206: Engineering Graphics Lab

Category	Title	Code	Credit-1	Practical Major Evaluation Max.Marks-30
Departmental	Engineering Graphics Lab	12241206	1 T P	Max.marks
Laboratory Course-DLC				

Laboratory Work

List of Experiments:

- 1. To prepare sheet of Plain scale, diagonal scale.
- 2. To prepare sheet of Projection of points and lines.
- 3. To prepare sheet of Projection of Planes.
- 4. To prepare sheet of Projection of Solids.
- 5. To prepare sheet of Section of Solids.
- 6. To prepare sheet of Development of Surfaces.
- To prepare sheet of Isometric Projections.

Skill Based Projects:

- 1. To prepare the 3D view of any object.
- 2. To Prepare scale for your home and make a map using this scale.
- 3. To prepare cut section models drawing of any object.
- 4. To make paper object, cut and show the development of surfaces.
- 5. To prepare simple drawing using Auto CAD.

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

CO2. Analyze and represent the positions of points and orientations of straight lines in different

CO3. Interpret and represent the projections of planes and solids in various orientations.

CO4. Create sectional views of solids using appropriate section planes, including anti-sections, and

CO5. Develop the ability to create isometric projections and views of 3D objects using isometric scales and Auto CAD.

Course Articulation Matrix

ourse Art	iculation	Matrix												PSO2
						1006	IPO7	PO8	PO9	PO10	FOL	PO12	PSOI	130.
	PO1	PO2	PO3	PO4	PO5	PO6	-	1		•	1	3		-
COI	3	3	2	2	<u>.</u>			1	-	-	1	3		-
CO2	3	3	2	2	<u>.</u>	2	-	1	•	•	1_	.,		
CO3	3	3	2	2	$\dot{-}$	1		1				,		-
CO4	3	3	2	-1	-	2		1	•	•		.,		
CO5	3	3	2	.3		1								

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Scheme of Evaluation



Item ME4 To review and finalize the Experiment list/ Lab manual and Micro Project-II for all the Laboratory Courses to be offered in B. Tech. II Semester (for batch admitted in 2024-25)



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Scheme of Evaluation



12241209: Micro Project-II (Metal Cutting & M/c Tools)

12241209: Micro Project	I-II (Metal Cu		0.44.1		Practical paper
Project Based Micro	Project-II Cutting & Tools)	Code 12241209	Credit-1	P 2	Major Evaluation-30

- 1. To familiarize with the basics of tools and equipment used in Machine shops.
- 2. To Prepare the objects using different machine tools.
- 3. To develop general machining skills in the students.

List of Experiments:

- Step Turning and Taper Turning on Lathe.
- 2. Threads Cutting and Knurling on Lathe.
- 3. Machining Flat Surface using Shaper Machine.
- 4. Manufacturing of Spur Gear using Milling Machine.
- 5. Making Internal Splines using Slotting Machine.
- 6. Hole on work piece through Drilling.
- 7. Grinding of Single Point Cutting Tool
- Slot / Groove cutting using shaping machine.

Laboratory Course Outcomes: After the completion of the course Lab student will be able to:

- CO1 Define the different conventional method of material removal and function of different parts.
- CO2 Apply the theory of metal cutting in experiments.
- CO3 Perform step, taper turning, knurling and threading. CO4 Produce stepped surface using shaper and keyway using milling machine.
- CO5 Demonstrate knowledge of different machine tools used in machine shop.
- CO6 Evaluate the chip thickness ratio, shear angle and material removal rate.

Micro Projects (Expandable)

- Make a Free energy Steam Engine at home 1.
- Make an Air Compressor at home 2.
- Mini Bench Tapping machine project 3.
- Make a Robotic Arm
- Make a Hydraulic Lift
- Thermal Expansion project
- Make a positive displacement pump



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Scheme of Evaluation



Course Articulation Matrix

						nac	007	PO8	PO9	PO10	PO11	PO12	PSO1	PSC
	PO1	PO2	PO3	PO4	PO5	P06	PO7	100	103		-	3	1	1
601	3	1	2	1	3	1	1	1	3		3			1
CO1			-	-	2	1	1	1	3	2	3	3	,	-
CO2	3	1				•			2	2	3	3	1	2
CO3	3	3	3	2	3	2	1	1			2	3	1	2
	2	3	3	2	3	1	2	1	3	1		-	1	2
CO4	3	-	-	-	2	2	1	1	3	1	2	3		-
CO5	3	3	3	3	3			2	3	2	2	3	1	2
COE	3	3	3	3	3	3	Z	3	_					

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(Declared Under Distinct Category by Ministry of Education, Government of India)





To review and finalize the syllabus/module of Classified Novel Engaging Course to be offered in I semester of PG Item ME6

programme.







CNEC PROPOSAL (Dept. of Mechanical Engineering)

ame of Faculty Mentor	Dr. Amit Aherwar
lovel Engaging Course Title	Research Management
Objectives of Course	To understand the importance of reference management To familiarize with reference management tools
Content	 Introduction to Reference Management Reference Management Tools Effective Research Strategies Citation and Plagiarism Management Advanced Reference Management Techniques Applying Reference Management in Engineering Research
Contact Hours	15 Hrs
Mode of Delivery	Blended (online & Offline both)
	After completion of the course, students will be able to:
Outcomes of Course	 Effectively use reference management tools Conduct and organize research efficiently Cite sources accurately and prevent plagiarism Integrate reference management with writing tools Adapt to emerging trends in reference management
External Mentors / Collaborations	Nil si Nil