List of Revised Courses

Department : *Mechanical Engineering*

Programme Name : *B.Tech.*

Academic Year : 2024-25

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	MEUETT1	Machine Design – I
02.	MEUETT2P	Dynamics Of Machinery
03.	MEUFTT1	MACHINE DESIGN - II

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2024-25

School : School Of Studies of Engg. & Technology

Department : *Mechanical Engineering*

Date and Time : 03-07-2024 ,3:30 PM

Venue : Online

The scheduled meeting of member of Board of Studies (BoS) of Department of Mechanical Engineering, School of Studies of Engg. & technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the B. Tech. III year (V and VI semesters) scheme and syllabi.

The following members were present in the meeting:

1. Dr. Soumya Gangopadhyay (External Expert Member BoS,Dept. of Mechanical Engg., IIT Bhilai)
2. Prof. S.P. Anbuudaysankar (Chairman, BoS, Dept. of Mechanical Engg.)
3. Dr.Pankaj Kumar Gupta (Member BoS, Assoc. Professor, Dept. of Mechanical Engg.)
4. Dr. Jasinta Poonam Ekka(Member BoS, Assoc. Professor, Dept. of Mechanical Engg.)
5. Mr. Roshan Singh Navlur, (Member, Industry Expert, Director, CADMATIC)
6. Dr. T.G. Loganathan (Invited member,Assoc. Prof., Dept. of Mechanical Engineering)

The following points were discussed during the meeting

1. The course syllabi for 7th and 8th semesters of B.Tech. III Year was discussed. With the consent of all the members, the course scheme and syllabi for the 5 th and 6 th semesters in B.Tech. III year Mechanical Engineering was finalized. Following points were discussed during the meeting

1. The syllabus of Machine Design – I and Machine Design – II and was thoroughly modified.
2. The content of Dynamics of Machinery was modified.

The committee discussed and approved the scheme and syllabi. The following courses were revised in the B. Tech. (V and VI Semesters) :

- MEUETT1 Machine Design – I
- MEUETT2P Dynamics Of Machinery
- MEUFTT1 MACHINE DESIGN - II

Signature & Seal of HoD

Scheme and Syllabus

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Scheme of Teaching and Evaluation 2024-25 (As per NEP-2020)
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)
(Effective from the Academic year 2024-25)

V-SEMESTER SCHEME OF TEACHING & EVALUATION 2024-25

S. N.	Course Type	Course Code	Course Title	Teaching Hours/week			Examination				Credits
				Theory lectures	Tutorial	Practical/Drawi	Examination Hours	CIA Marks	SEA Marks	Total Marks	
				L	T	P					
1	Department Core	MEUETT1	Machine Design – I	3	1	-		40	60	100	4
2	Department Core	MEUETT2	Dynamics of Machines	3	-	-		40	60	100	3
3	Department Core	MEUETT3	Heat and Mass Transfer	3	-	-		40	60	100	3
4	Industry Course	MEUETI1	Innovation and Design Thinking	1	-	-		100	-	100	1
		MEUETI2	Maintenance Engineering and Management								
5	Open Elective	MEUETO1	Fundamentals of Thermodynamics*	3	-	-		40	60	100	3
6	Practical	MEUELT1	HMT Lab	-	-	2		20	30	50	1
7	Practical	MEUEPV1	Mini Project - II	-	-	3		20	30	50	2
8	Practical	MEUELT2	TOM Lab	-	-	2		20	30	50	1
9	Practical	MEUELT3	Modeling and Simulation – I Lab	1	-	2		20	30	50	2
Total				**14**	**1**	**09**		**340**	**360**	**700**	**20**
* Not for ME students											

Credit Definition:
- 1-hour lecture (L) per week per semester = 1 Credit
- 1-hour tutorial (T) per week per semester = 1 Credit
- 2-hour Practical/Drawing(P) per week per semester = 1 Credit

- **Four credit** courses are to be designed for 50 hours of Teaching-Learning process.
- **Three credit** courses are to be designed for 40 hours of Teaching-Learning process.
- **Two credit** courses are to be designed for 30 hours of Teaching-Learning process.
- **One credit** courses are to be designed for 15 hours of Teaching-Learning process

Note: The above is applicable only to THEORY courses

CIA: Two internal Class Tests, each of 15 Marks.

Assignment: 10 Marks

SEA: Semester End Assessment – 60 marks

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Scheme of Teaching and Evaluation 2024-25 (As per NEP-2020)

Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

(Effective from the Academic year 2024-25)

VI-SEMESTER SCHEME OF TEACHING & EVALUATION 2024-25

S. N.	Course Type	Course Code	Course Title	Teaching Hours/week			Examination				Credits
				Theory lectures	Tutorial	Practical/Drawi	Examination Hours	CIA Marks	SEA Marks	Total Marks	
				L	T	P					
1	Department Core	MEUFTT1	Machine Design – II	3	1	-		40	60	100	4
2	Department Core	MEUFTT2	Finite Element Analysis	3	-	-		40	60	100	3
3	Department elective	MEUFTP1	Machine Tool Technology	3	-	-		40	60	100	3
		MEUFTP2	Product Design & Development								
		MEUFTP3	Material Characterization								
4	Industry Course	MEUFTI1	Metal Cutting	1	-	-		100	-	100	1
		MEUFTI2	Environment Friendly Power Generation from Coal								
5	Open Elective	MEUFTO1	Fundamentals of Fluid Mechanics*		-	-		40	60	100	3
6	Project	MEUFPV1	Mini Project			3		20	30	50	2
7	Practical	MEUFLT1	MTT Lab	-	-	2		20	30	50	1
8	Practical	MEUFLT2	Modeling and Simulation – II Lab	-	-	2		20	30	50	1
Total				**10**	**1**	**7**		**320**	**330**	**650**	**18**
* Not for ME students											

Credit Definition:

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- 1-hour tutorial (T) per week per semester = 1 Credit
- 2-hour Practical/Drawing(P) per week per semester = 1 Credit

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- One credit courses are to be designed for 15 hours of Teaching-Learning process

Note: The above is applicable only to THEORY courses

CIA: Two internal Class Tests, each of 15 Marks.

Assignment: 10 Marks

SEA: Semester End Assessment – 60 marks

Guru Ghasidas Vishwavidyalaya
Central University
Department of Mechanical Engineering

CODE	COURSE NAME	HOURS PER WEEK			CIA	SEA	CREDIT
		L	T	P			
	MACHINE DESIGN - I	3	1	-	40	60	4

Course objectives:

1. Impart knowledge on various types of stress components and theories of failure.
2. Emphasis on the significance of loading nature on the design of machine elements.
3. Make the students understand the design of temporary and permanent joints.
4. To enable students to design IC engine components.

UNIT – I	Steady and Variable stress on machine elements
	Selection of Materials, Design Stress – Tension, Bending and Torsion, Factor of Safety, Stress concentration factor, Theories of failures, Calculation of principle stresses for various load combinations, Notch sensitivity, Design for variable and repeated loadings, Fatigue stress concentration factor and Endurance diagrams.
UNIT -II	Design of shafts and Couplings
	Transmission shaft, Design against static load, Design for strength, Rigidity and stiffness. Types of keys and Splines, Design of Cotter joint, Sleeve and Cotter joint and Design of Knuckle joint. Couplings: Types of couplings, Design of flange and flexible couplings, Compression coupling, Muff coupling.
UNIT -III	Threaded Fasteners
	The geometry of thread forms, Terminology of screw threads and thread standards, Initial tension, Relation between bolt tension and torque, and Design of statically loaded tension joints. Design of bolted joints due to eccentric loading. Power Screws: Power screws, Force analysis, Stresses in screw, Coefficient of friction, Efficiency of thread.
UNIT IV	Welded and Riveted joints
	Welded joint: Types of welded joints, Stresses in butt and fillet welds, eccentrically loaded joint, welded joint subjected to bending moment, Design procedure, Fillet welds under varying loads. Riveted Joints: Types of rivet heads, joints, Failure of riveted joint, Strength of rivet joint, Efficiency of riveted joint, Design of riveted joint, eccentrically loaded riveted joint.
UNIT V	Design of IC Engine Parts
	Flywheels considering stresses in rims and arms for engines and punching machines Connecting Rods - Forces Acting on the Connecting Rod - Design of Connecting Rod. Crankshafts - Design Procedure for Crankshaft - Design for Centre Crankshaft - Side or Overhung Crankshaft.

Guru Ghasidas Vishwavidyalaya
Central University
Department of Mechanical Engineering

CODE	COURSE NAME	HOURS PER WEEK			CIA	SEA	CREDIT
		L	T	P			
MEUETT2	Dynamics Of Machinery	2	1	-	40	60	3

Course objectives:

1. Make students understand the fundamental knowledge of dynamics and the concept of a gyroscope.
2. Impart the knowledge of inertia forces and flywheels.
3. Enabling students to balance rotating and reciprocating masses in a mechanism.
4. To impart knowledge on various types of governors.
5. To Understand the fundamental concept of vibrations

UNIT – I	Gyroscope
	Gyroscope: Gyroscopic forces and couple (Torque), Angular velocity and acceleration of gyroscope, gyroscopic effect on naval ships, gyroscopic effect on aeroplane and vehicle moving on a curved path.
UNIT – II	Inertia force analysis
	Inertia force analysis: Effective force and inertia force of a link, D-Alembert's principle and dynamic equilibrium, equivalent offset inertia force, dynamically equivalent system, velocity and acceleration of piston, inertia forces in reciprocating engine, engine force analysis, inertia of connecting rod, Flywheels, turning moment diagram for single and multi-cylinder I.C. Engine, Co-efficient of fluctuation of speed, Co-efficient of fluctuation of energy.
UNIT – III	Balancing
	Balancing: Static and dynamic balancing, balancing of rotating masses and balancing of reciprocating masses, balancing of locomotives, the effect of partial balancing in the locomotive balancing of I.C. Engine, balancing of IN-line engine, balancing of V-engine, balancing of a radial engine, forward and reverse crank method
UNIT – IV	Governors
	Governors: Types of governors, centrifugal governor, spring-controlled governor, Watt, Porter and Proell, Hartnell, Hartung governor, governor effect, Power stability, Inertia effects. Governor Performance parameters.
UNIT -V	Vibration
	Vibration: One dimensional longitudinal, transverse, and torsional vibrations, natural frequency, effect of damping on vibrations, types of damping, different types of damping. Forced vibration, forces and displacement, transmissibility, vibration isolation, vibration sensors: seismometer and accelerometers Whirling of shafts with a single rotor.

TEXTBOOKS:

1. Theory of Machines - S. S. Ratan, McGraw Hill Education India
2. Theory of Machines -Thomas Beven, Pearson Publications
3. Theory of Mechanisms and Machines -Amitabh Ghosh and Ashok Kumar Mallik, East West Press
4. Theory of Machines and Mechanisms- John J. Uicker Jr., Gordon R. Pennock, and Joseph E. Shigley, McGraw Hill Education India
5. Mechanisms and Machines Theory-J.S. Rao & R.V. Dukkipati, Wiley Eastern Limited

REFERENCE BOOKS:

Theory of Machines– R. S. Khurmi, J. K. Gupta, S. Chand Publications.

Guru Ghasidas Vishwavidyalaya
Central University
Department of Mechanical Engineering

CODE	COURSE NAME	HOURS PER WEEK			CIA	SEA	CREDIT
		L	T	P			
MEUFTT1	MACHINE DESIGN - II	3	1	-	40	60	4

Course objectives:

1. Make students understand the types of springs and designs based on load.
2. Impart the knowledge of gear terminology and use the design data to calculate gear parameters.
3. Enabling students to use the design catalogue to select suitable bearings.
4. To impart knowledge on various types of belt drive and brakes.

UNIT – I	Spring Design
	Springs: Spring Materials and Their Mechanical Properties, Equation for Stress and Deflection, Helical Coil Springs of Circular Section for Tension, Compression and Torsion, Dynamic Loading, Fatigue Loading, Wahl Line, Leaf Spring and Laminated Spring.
UNIT – II	Gear Design
	Gears: Spur Gears, Gear Drives, Classification of Gears, Selection of Type of Gears, Law of Gearing, Force Analysis, Gear Tooth Failures, Selection of Material, Number of Teeth, Face Width, Beam Strength of Gear Tooth, Effective Load on Gear Tooth, Estimation of Module, Gear Design for Maximum Power Transmitting Capacity. Helical Gears, Terminology of Helical Gears, Virtual Number of Teeth, Tooth Proportions, Force Analysis, Beam Strength of Helical Gears, Effective Load on Gear Tooth, Wear Strength of Helical Gears. Bevel Gears, Terminology of Bevel Gears, Force Analysis, Beam Strength of Bevel Gears, Wear Strength of Bevel Gears, Effective Load on Gear Tooth.
UNIT – III	Bearings
	Rolling Contact Bearings, Types of Ball and Roller Bearings, Selection of Bearing for Radial and Axial Load, Bearing Life, Mounting and Lubrication. Journal Bearing - Contact Type and Clearance Type. Journal Bearings: Types of Lubrication, Viscosity, Hydrodynamic Theory of Lubrication, Sommerfeld Number, Heat Balance, Self-contained Bearings, Bearing Materials
UNIT – IV	Belt and Rope Drives
	Belt Drive: Flat and V-belts, Belt Constructions, Geometrical Relationships for Length of the Belt, Analysis of Belt Tensions, and Condition for Maximum Power, Selection of Flat & V-Belts, and Adjustment of Belt Tensions. Pulleys for Flat & V-belts, Wire rope and stress in wire ropes.
UNIT -V	Gear Boxes
	Geometric progression- Standard step ratio- Ray diagram, kinematics layout Design of sliding mesh gear box- Design of multi-speed gear box for machine tool applications- Constant mesh gear box- Speed reducer, Variable speed gear box.

TEXTBOOKS:

1. Machine Design- J. E. Shigley -McGraw Hill Publications.
2. Design of Machine Elements - V. B. Bhandari, TMH Publications.
3. Machine Design, Spott, TMH Publications.
4. PSG - Design Data Book – PSG College, Coimbatore.
5. Principles of Mechanical Design, R. Phelan, McGraw Hill Pub