



List of Courses Focus on Employability/ Entrepreneurship /Skill Development

Department : *Mechanical Engineering*

Programme Name: *B. Tech*

Academic Year:

School : *School of Studies of Engineering and Technology*

Courses which focus on Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework:

Sr. No.	Course Code	Name of the Course
01	LW201TMC01	INDIAN CONSTITUTION
02	CM201TES03	BASIC CIVIL & MECHANICAL ENGINEERING
03	ME07TPE051	POWER PLANT ENGINEERING
04	ME07TPE52	MAINTENANCE MANAGEMENT



**SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)**

**CBCS-NEW, EVALUATION SCHEME
PROPOSED (W.E.F. SESSION 2020-21)
B. TECH. FIRST YEAR (SEMESTER- I)
(Common for CH, CE, IPE, ME)**

S.No.	COURSE No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	SUB-TOTAL	
THEORY									
1.	MA201TBS01	MATHEMATICS-I	3	1	-	30	70	100	4
2.	CY201TBS02	CHEMISTRY	3	1	-	30	70	100	4
3.	CE201TES01	ENGINEERING MECHANICS	3	1	-	30	70	100	4
4.	CS201TES02	COMPUTER PROGRAMMING	3	0	-	30	70	100	3
5.	CM201TES03	BASIC CIVIL & MECHANICAL ENGINEERING	3	0	-	30	70	100	3
6.	LW201TMC01	INDIAN CONSTITUTION	2	0	-	-	-	-	-
TOTAL			17	3	-	150	350	500	18
PRACTICALS									
1.	CY201PBS01	CHEMISTRY LAB	-	-	2	30	20	50	1
2.	CE201PES01	ENGINEERING MECHANICS LAB	-	-	2	30	20	50	1
3.	CS201PES02	COMPUTER PROGRAMMING LAB	-	-	2	30	20	50	1
TOTAL			-	-	6	90	60	150	3
GRAND TOTAL			17	3	6	240	410	650	21

Total Credits:21

Total Contact Hours:26

Total Marks:650

L:LECTURE, T:TUTORIAL, P:PRACTICAL, IA : INTERNAL ASSESSMENT, ESE:END SEMESTER EXAMINATION

*INTERNAL ASSESSMENT- Two Class Test of 15 Marks each will be conducted.

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B. TECH. FIRST YEAR SYLLABUS (W.E.F SESSION 2020-21)

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credit s
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	LW201TMC01							--	--	--
Subject:	INDIAN CONSTITUTION	2	0	-	-	-	-			

Course Learning Objectives:

- To the importance of preamble of the constitution of India.
- To understand the fundamental rights and duty as a citizen of India.
- To understand the functioning of union and state government and their inter-relationship.

Course Content:

UNIT 1: Introduction: Constitution-meaning of the term, Sources and constitutional theory, Features, Citizenship, Preamble.

UNIT 2: Fundamental Rights and Duties: Fundamental Rights, Fundamental Duties, Directive Principles of State Policy

UNIT 3: Union Government: Structure of Indian Union: Federalism, Centre-State relationship President: Role. Power and position, Prime Minister and council of ministers, Cabinet and Central Secretariat, Lok Sabha. Rajya Sabha

UNIT 4: State Government: Governor: Role and position, Chief Minister and council of ministers, State Secretariat

UNIT 5: Relationship between Centre and States: Distribution of Legislative Powers, Administrative Relations, Coordination between States

Textbooks/References:

1. Constitution of India, V.N. Shukla
2. The Constitutional Law of India, J.N. Pandey
3. Indian Constitutional Law. M.P. Jain

Course Outcome: At the end of the course students will be able to:

- Describe the salient features of the Indian Constitution
- List the Fundamental Rights and Fundamental Duties of Indian citizens
- Describe the Directive Principles of State Policy and their significance

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B. TECH. FIRST YEAR SYLLABUS (W.E.F SESSION 2020-21)

SYLLABUS	(SEMESTER-I)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CM201TES03 / CM202TES05							70	100	03
Subject:	BASIC CIVIL & MECHANICAL ENGINEERING	3	0	-	15	15	30			

Course Learning Objectives:

- To study the properties and uses of basic civil engineering materials.
- To study the importance of NBC, IS Codes (materials), types of buildings and foundations, basic requirements of foundations.
- To study the basic types of surveys, linear and angular measurements, and GPS measurements
- To familiarize with the fundamentals of heat and work interactions, heat transfer mechanisms and energy conversion processes.
- To provide exposure to various engineering materials and processes of manufacturing.
- To impart basic knowledge of the interdisciplinary nature of engineering systems.

Course Content:

UNIT 1: Civil Engineering Materials: Properties & Uses of Stones, Bricks, Cement, Aggregates, Steel, Concrete-quality of good concrete, strength, curing and grade of concrete, standard tests on concrete. IS Codes and classification

UNIT 2: National Building Code (NBC), Salient features, Classification of Building as per NBC(India), Site selection for buildings - Components of building, Foundations-Introduction, Types of Foundations & its Suitability, Basic requirements and purpose of foundation on different soils.
Brief description about: Brick & stone masonry, Plastering, Lintels; Doors & Windows, Beams & columns, Formwork, Roofs.

UNIT 3: Surveying: Objects, uses, Basic principle, Classification, Plans & Maps, Scales, Units of measurement, Conventional symbols, Different survey equipment.
Measurements – Linear & Angular, levelling, Determination of Area & Volume, Introduction to Triangulation and GPS–

UNIT 4: Materials and Manufacturing, Introduction to engineering materials – metals, alloys, composites, smart materials, phase-change materials; Introduction to various processes of manufacturing – conventional machine tools – lathe and its types, shaping, milling and related operations – turning, threading, knurling, etc., unconventional methods.

UNIT 5: Automobile and Refrigeration and Air conditioning, Theoretical thermodynamic cycles and working principle of Petrol and Diesel Engines – Hybrid and Electric Vehicle - Turbines, Pumps, Compressors. Principle of vapour compression and absorption refrigeration system–Layout of typical domestic refrigerator–Window and Split type room Air conditioner. **Introduction to renewable energy utilization and technology.**

Textbooks/References:

- Punmia, B.C, Ashok Kumar Jain, Arun Kumar Jain, Basic Civil Engineering, Lakshmi Publishers, 2012.
- Satheesh Gopi, Basic Civil Engineering, Pearson Publishers, 2009.
- Rangwala, S.C, Building materials, Charotar Publishing House, Pvt. Limited, Edition 27, 2009.
- Palanichamy, M.S, Basic Civil Engineering, Tata McGraw Hill, 2000.

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DEPARTMENT OF MECHANICAL ENGINEERING
CBCS-NEW, STUDY & EVALUATION SCHEME
W.E.F. SESSION 2021-2022

Year: B.Tech. 4th year

SEMESTER- VII

SN	Course No.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	INTERNAL ASSESSMENT	ESE	SUB-TOTAL	
1.	ME07TPC12	Refrigeration and Air Conditioning	3	1	-	30	70	100	4
2.	ME07TPE04	Professional Elective-04	3	0	-	30	70	100	3
3.	ME07TPE05	Professional Elective-05	3	0	-	30	70	100	3
4.	ME07TOE04	Open Elective-04	3	0	-	30	70	100	3
5.	ME07TMC04	Indian Constitution	3	0	-	-	-	-	-
Total			15	1	-	120	280	400	13
PRACTICALS									
1.	ME07LPC08	Refrigeration and Air Conditioning Lab	-	-	2	30	20	50	1
2.	ME07LSC02	Seminar on Summer Training	-	-	3	50	-	50	1.5
3.	ME07LMP01	Minor Project	-	-	8	100	-	100	4
Total			0	0	13	60	40	200	6.5

Total Credits: 19.5

Total Contact Hour: 29

Total Marks: 600

*INTERNAL ASSESSMENT- Two Class Test of 15 Marks each will be conducted.

L-LECTURE, T-TUTORIAL, P-PRACTICAL, ESE –END SEMESTER EXAMINATION

ME07TPE04 Professional Elective-04	ME07TPE05 Professional Elective-05
ME07TPE41 Finite Element Method	ME07TPE51 Power Plant Engineering
ME07TPE42 Theory of Vibration	ME07TPE52 Maintenance Management
ME07TPE43 Modeling and Simulation	ME07TPE53 Gas Dynamics and Jet Propulsion
ME07TOE03 Open Elective-04	
ME07TOE41 Production Planning and Control	
ME07TOE42 Optimization in Engineering Design	
ME07TOE43 Manufacturing Automation	

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Power Plant Engineering

1.	Department/Center proposing the course	Mechanical Engineering
2.	Course title	Power Plant Engineering
3.	L-T-P Structure	3-0-0
4.	Credits	3
5.	Course number	ME07TPE51
6.	Status (Category for program)	Professional Elective

7.	Pre-requisites	Thermal Engineering
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7.1.	Overlap with any UG/PG course of the Dept./Centre	No
7.2.	Overlap with any UG/PG course of other Dept./Centre	No
7.3.	Super cedes any existing course	No

8.	Not allowed for (indicate program names)	NA
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9.	Frequency of offering	Odd Semester
10.	Faculty who can teach the course	Fluid-Thermal

11.	Will the course require any visiting faculty	No
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12.	Course objectives (about 50 words):
	<ul style="list-style-type: none"> To impart knowledge on sources of energy and types of power plants To understand construction and working of Steam Power Plants, Hydro Electric power station, diesel power station, and Nuclear Power Station. To impart knowledge about various performance characteristics and analysis of power plants. To impart knowledge about energy, economic and environmental factors associated with power plants.

13.	Course outcomes (about 50 words):
	<ul style="list-style-type: none"> Demonstrate a basic understanding of various types of power plants. Acquire knowledge in the design and development of mechanical systems associated with power plants. Compare different energy resources and choose the most appropriate based on local conditions


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	<ul style="list-style-type: none">• Perform simple techno-economical assessments of energy resources• Design power plant that meet specific energy demands, that are economically feasible and have a minimal impact on the environment
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14.	<p>Course contents(about 100 words) (include laboratory/design activities):</p> <p>UNIT-I: Coal based thermal power plants, basic Rankine cycle and its modifications, layout of modern coal power plant, super critical boilers, FBC boilers, turbines, condensers, steam and heating rates, subsystems of thermal power plants, fuel and ash handling, draught system, feed water treatment, binary cycles and cogeneration systems</p> <p>UNIT-II: Gas turbine and combined cycle power plants, Brayton cycle analysis and optimization, components of gas turbine power plants, combined cycle power plants, Integrated Gasifier based Combined Cycle (IGCC) systems.</p> <p>UNIT-III: Basics of nuclear energy conversion, Layout and subsystems of nuclear power plants, Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANDU Reactor, Pressurized Heavy Water Reactor (PHWR), Fast Breeder Reactors (FBR), gas cooled and liquid metal cooled reactors, safety measures for nuclear power plants.</p> <p>UNIT-IV: Hydroelectric power plants, classification, typical layout and components, principles of wind, tidal, solar PV and solar thermal, geothermal, biogas and fuel cell power systems</p> <p>UNIT-V: Energy, economic and environmental issues, power tariffs, load distribution parameters, load curve, capital and operating cost of different power plants, pollution control technologies including waste disposal options for coal and nuclear plants.</p>
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Maintenance Management

1.	Department/Center proposing the course	Mechanical Engineering
2.	Course title	Maintenance Management
3.	L-T-P Structure	3-0-0
4.	Credits	3
5.	Course number	ME07TPE52
6.	Status (Category for program)	Professional Elective-05 (ME07TPE05)

7.	Pre-requisites	Nil
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8.	Status vis-à-vis other courses (Give Course number/title)	
8.1.	Overlap with any UG/PG course of the Dept./Centre	No
8.2.	Overlap with any UG/PG course of other Dept./Centre	No
8.3.	Super cedes any existing course	No

9.	Not allowed for (indicate program names)	
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10.	Frequency of offering	<input type="checkbox"/> Every sem <input type="checkbox"/> 1 st Sem <input checked="" type="checkbox"/> 2 nd Sem <input type="checkbox"/> Either Sem: 7 th sem
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11.	Faculty who will teach the course	Industrial Management
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12.	Will the course require any visiting faculty	Visiting faculty from manufacturing industries
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13.	Course objectives:	
	<ul style="list-style-type: none"> • To understand the principles, functions and practices adapted in industry for the successful management of maintenance activities. • To provide the concept of various types of maintenance system and strategies used in industries. • To impart the knowledge to understand the aspects of tribology in maintenance management system. • To be familiar with the architectures of machine health monitoring as well as total productive maintenance. • To understand the reliability, availability and maintainability concepts and 	



various aspects and formulate for reliability analysis of goods.

Course objectives:

After studying this course, the students are able to:

- Implement the principles, functions and practices adapted in industry for the successful management of maintenance activities.
- Understand and exercise the concept of various types of maintenance system and strategies for managing industries.
- Apply the various tribology techniques for maintenance management of machines or system.
- Sensed the various architectures of machine health monitoring as well as total productive maintenance.
- Calculate the reliability, availability and maintainability of goods.

14. **Course contents**(about 100 words) (include laboratory/design activities):

- Fundamentals & importance of maintenance engineering, inventory control, productivity, safety, pollution control, Safety regulations, pollution problems, human reliability, total quality management (TQM), total productivity maintenance (TPM), environmental issues in maintenance, ISO 9000.
- Types of maintenance strategies, planned & un planned maintenance, breakdown, preventive & predictive maintenance. Advantages & limitations, computer aided maintenance, maintenance scheduling, spare part management, inventory control, organization of maintenance department.
- Friction, wear & lubrication, wear mechanism, prevention of wear, types of lubrication mechanism & process. Types of lubricants, seals & packaging.
- Condition based maintenance, signature analysis, oil analysis, vibration, noise & thermal signatures, online & off line techniques. Instrumentation & equipment used, signal processing, data acquisition & analysis, application of intelligent systems, data base design. TPM, Pillars of TPM, Terri technology.
- Reliability, availability & maintainability (RAM) analysis: failure data analysis, failure distribution, Reliability of repairable & non-repairable systems, improvement in reliability, reliability testing, reliability prediction, utilization factor, System reliability by Monte Carlo simulation technique, FMECA.

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