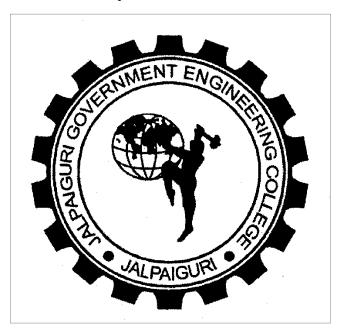# JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
JALPAIGURI- 735102
(An Autonomous Government College)

COURSE STRUCTURE AND SYLLABUS
FOR
FIRST SEMESTER TO EIGHTH SEMESTER B.TECH. DEGREE

IN
MECHANICAL ENGINEERING

(Implemented for the new entry batch from the Academic Year 2021-22)

www.jgec.ac.in

Phone: 03561 – 255131 (Principal), Fax: 03561 – 256143

CC	SC	Subject Name	L –T-P-TO	Cr.	CC	SC	Subject name	L –T-P-TO	Cr.
BSC	BS-PH101	Physics	3-1-0-4	4	BSC	BS-CH201	Chemistry	3-1-0-4	4
BSC	BS-M101B	Mathematics-1B	3-1-0-4	4	BSC	BS-M201B	Mathematics-IIB	3-1-0-4	4
ESC	ES-CS101	Programming for Problem Solving	3-0-0-3	3	ESC	ES-EE201	Basic Electrical Engineering	3-1-0-4	4
BSC	BS-PH191	Physics Laboratory	0-0-3-3	1.5	HUM	HM-HU201	English	2-0-0-2	2
ESC	ES-CS191	Programming for Problem Solving Laboratory	0-0-4-4	2	BSC	BS-CH291	Chemistry Laboratory	0-0-3-3	1.5
ESC	ES-ME191	Workshop/Manufacturing Practice	1-0-4-5	3	ESC	ES-EE291	Basic Electrical Engineering Laboratory	0-0-2-2	1
Mandatory Induction Program- 3 weeks duration. It is to be done before initiation of classes (theoretical, laboratory & sessional) as per syllabus following guidelines of AICTE and MAKAUT					ESC	ES-ME291	Engineering Graphics & Design	1-0-4-5	3
					HUM	HM-HU291	Language Laboratory	0-0-2-2	1
			10-2-11-23	17.5				12-3-11-26	20.5
BSC	BS-M (ME)301	Mathematics III	3-1-0-4	4	PCC	PC-ME401	Applied Thermodynamics	3-1-0-4	4
BSC	BS-CH (ME)301	Biology	3-0-0-3	3	PCC	PC-ME402	Fluid Mechanics & Fluid Machines	3-1-0-4	4
ESC	ES-ECE (ME)301	Basic Electronics Engineering	3-0-0-3	3	PCC	PC-ME403	Strength of Materials	3-1-0-4	4
ESC	ES-ME301	Engineering Mechanics	3-1-0-4	4	PCC	PC-ME404	Manufacturing Processes	4-0-0-4	4
ESC	ES-ME302	Materials Engineering	3-0-0-3	3	PCC	PC-ME405	Metrology and Instrumentation	3-1-0-4	4
PCC	PC-ME301	Thermodynamics	3-1-0-4	4	PCC	PC-ME491	Machine Drawing II	0-0-3-3	1.5
PCC	PC-ME391	Machine Drawing- I	0-0-3-3	1.5	PCC	PC-ME492	Practice of Manufacturing Processes and Systems Laboratory	0-0-3-3	1.5
					MC	MC-ME481	Environmental Science	0-0-2-2	0
			18-3-3-24	22.5				16-4-8-28	23
PCC	PC-ME501	Heat Transfer	3-1-0-4	4	PCC	PC-ME601	Manufacturing Technology	4-0-0-4	4
PCC	PC-ME502	Solid Mechanics	3-1-0-4	4	PCC	PC-ME602	Design of Machine Elements	3-1-0-4	4
PCC	PC-ME503	Kinematics & Theory of Machines	3-1-0-4	4	PEC	PE-ME601	Elective-I	3-0-0-3	3
HUM	HM-HU501	Humanities- I	3-0-0-3	3	PEC	PE-ME602	Elective-II	3-0-0-3	3
MC	MC-ME501	Essence of Indian Knowledge Tradition	2-0-0-2	0	HUM	HM-HU601	Humanities II (OR)	3-0-0-3	3
PCC	PC-ME591	Mechanical Engineering Laboratory-I (Thermal)	0-0-3-3	1.5	MC	MC-ME601	Constitution of India	2-0-0-2	0
PCC	PC-ME592	Practice of Manufacturing Processes	0-0-3-3	1.5	PCC	PC-ME691	Mechanical Engineering Laboratory-II (Design)	0-0-3-3	1.5
Project (Summer Internship)	PW-ME581	Project-I (30 hrs. Total)	0-0-2-2	1	Project (Summer internship)	PW-ME681	Project-II (90 hrs. Total)	0-0-4-4	2
			14-3-8-25	19				18-1-7-26	20.5
PCC	PC-ME701	Advanced Manufacturing Technology	3-0-0-3	3	PEC	PE-ME801	Elective V	3-0-0-3	3
PEC	PE-ME701	Elective III	3-0-0-3	3	PEC	PE-ME802	Elective-VI	3-0-0-3	3
PEC	PE-ME702	Elective-IV	3-0-0-3	3	OEC	OE-ME801	Open Elective- II	3-0-0-3	3
OEC	OE-ME701	Open Elective- I	3-0-0-3	3	OEC	OE-ME802	Open Elective- III	3-0-0-3	3
HUM	HM-HU701	Economics for Engineers	2-0-0-2	2	Project	PW-ME881	Project-IV	0-0-10-10	5
PCC	PC-ME791	Mechanical Engineering Laboratory-III (Manufacturing)	0-0-3-3	1.5	PCC	PW-ME882	Comprehensive Viva- Voce	0-0-0-0	1.5
Project	PW-ME781	Project-III	0-0-6-6	3					
			14-0-9-23	18.5				12-0-10-22	18.5

There are six Professional Elective Course Papers in Semester VI, VII and VIII as follows:
(Elective-I) PE-ME601, (Elective-II) PE-ME602, (Elective-III) PE-ME701,
(Elective-IV) PE-ME702, (Elective-V) PE-ME801 and (Elective VI) PE-ME802.

Students are to choose one paper for each of the Professional Elective Courses specified in the curriculum structure of a Semester from the following list of Professional Elective Papers. Selection of a paper should be non-repetitive. If a student chooses the paper, **Internal Combustion Engines and Gas Turbines (Code: A1)** as a **Professional Elective I in Semester VI**, its paper code will be **PE-ME601A1**. Similarly, in case **Mechanical Vibration (Code: B3)** is chosen by one in **Semester VII as Professional Elective-IV**, its paper Code will be **PE-ME702B3**.

Subject Code	Subject name
Thermo-Fluid Group	
A1	Internal Combustion Engines and Gas Turbines
A2	Automobile Engineering
A3	Gas Dynamics and Jet Propulsion
A4	Refrigeration and Air Conditioning
A5	Turbo Machinery
A6	Fluid Power Control
A7	Advanced Fluid Mechanics
A8	Analysis and Performance of Fluid Machines
A9	Computational Fluid Dynamics
A10	Power Plant Engineering
A11	Cryogenics
A12	Introduction to Wind Engineering
A13	Elements of Atmospheric Fluid Dynamics
Design Group	
B1	Composite Materials
B2	Selection and Testing of Materials
B3	Mechanical Vibration
B4	Tribology
B5	Finite Element Analysis
B6	Mechatronics
Manufacturing Group	
C1	Advanced Welding Technology
C2	Quantity Production Methods
C3	3D Printing and Design
C4	Micro and Nano Manufacturing

C5	CAD/CAM
C6	Robotics
C7	Material Handling
C8	Principles and Practices of Management
C9	Process Planning and Cost Estimation
C10	Maintenance Engineering

There are three Open Elective Course Papers in Semester VII and VIII as follows:
(Open Elective-I) OE-ME701, (Open Elective-II) OE-ME801, and
(Open Elective-III) OE-ME802.

Students are to choose one paper for each of the Open Elective Courses specified in the curriculum structure of a Semester from the following list of Open Elective Papers. Selection of a paper should be non-repetitive. If a student chooses the paper, **Industrial Engineering (Code: A)** as an **Open Elective-I in Semester VII**, its paper code will be **OE-ME701A**. Similarly, in case **Safety and Occupational Health (Code: F)** is chosen by one in **Semester VIII as Open Elective-III**, its paper Code will be **OE-ME802F**.

Subject Code	Subject Name
A	Industrial Engineering
B	Total Quality Management
C	Project Management
D	Entrepreneurship Development
E	Introduction to Product Design and Development
F	Safety and Occupational Health
G	Industrial Pollution and Control
H	Energy Conservation and Management
I	Non-conventional Energy Sources
J	Waste to Energy- An Overview
K	Biomechanics and Biomaterials
L	Computational Methods in Engineering
M	Automation & Control
N	Internet of Things (IoT)
O	Artificial Intelligence (AI)
P	Block Chain
Q	Cyber Security
R	Quantum Computing
S	Data Sciences
T	Machine Learning
U	Virtual Reality (VR)
V	Water Resource Engineering

*** I: to be replaced by "Renewable Energy Resources"