Course Outcome of the Courses of B.Tech. 4th Semester and Mapping of the Course Outcome with Programme Outcome

Sl. No.	Sub-Code	Subject	Hours per Week			Credit	Marks	
			L	T	P	C	CE	ESE
Theory								
1	ECE181407	Applied Electronics	3	0	2	4	30	70
2	ME181402	Workshop Theory and Practice-I	3	0	2	4	30	70
3	ME181403	Fluid Mechanics-I	3	0	0	3	30	70
4	ME181404	Materials Science	3	0	2	4	30	70
5	ME181405	Mechanics of Materials	3	0	0	3	30	70
6	MC181406	Environmental Science	2	0	0	0 (PP/NP)	-	100
Practical								
1	ME181413	Fluid Mechanics–I Lab	0	0	2	1	15	35
2	ME181415	Mechanics of Materials Lab	0	0	2	1	15	35
TOTAL			17	0	10	**20**	**180**	**520**
Total Contact Hours per week : 27								
Total Credit: 20								

NB: 1. MC181406 is a Mandatory Audit Course (No Credit). It will be evaluated as PP (Pass)or NP (Not Pass)

2. 2-3-weeks Mandatory Academia Internship need to be done in the 4th semester break and the report is to be submitted and evaluated in 5th semester

APPLIED ELECTRONICS (ECE181407)

Course Outcomes (COs) : At the end of the course, the student will be able to

CO1	Explain different semiconductor devices and their areas of application
CO2	Explain the working of diode along with their various areas of applications
CO3	Check the stability of transistors based on the calculation of current, voltage and power of the transistor circuit
CO4	Apply Boolean laws, De-Morgan's theorem, Karnaugh Map to solve digital circuits and explain combinational and sequential circuits
CO5	Explain clock timing circuits and compute rise time, fall time, duty cycle
CO6	Explain different types of sensors and robotic systems

Mapping of COs with POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	1	1	1	-	1
CO2	2	-	-	-	-	-	-	1	1	1	-	1
CO3	2	3	-	-	-	-	-	1	1	1	-	1
CO4	3	-	-	-	-	-	-	1	1	1	-	1
CO5	2	-	-	-	-	-	-	1	1	1	-	1
CO6	2	-	-	-	-	-	-	1	1	1	-	1

WORKSHOP THEORY AND PRACTICE (ME181402)

Course Outcomes (COs): At the end of the course, the student will be able to

CO1	Explain the functions, components and operating processes of different Lathe Machines.
CO2	Explain the functions, components and operating processes of shaper, planner, broaching, and slotting machines.
CO3	Explain the functions, components and operating processes of milling machines.
CO4	Explain the components and operating processes of grinding, lapping, honing, superfinishing, polishing, buffing, and tumbling,
CO5	Apply techniques of pattern making, sand molding and casting.
CO6	Apply the concept of metal cutting and develop product/parts of machine components with different machines.

Mapping of COs with POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	P7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	-	-	-	-	-	1	1	1	-	1
CO2	2	1	-	-	-	-	-	1	1	1	-	1
CO3	2	1	-	-	-	-	-	1	1	1	-	1
CO4	2	1	-	-	-	-	-	1	1	1	-	1
CO5	2	1	-	-	-	-	-	1	1	1	-	1
CO6	2	2	3	-	-	-	-	1	1	1	-	1

FLUID MECHANICS – I [ME181403]

Course Outcomes (COs) : At the end of the course, the student will be able to

CO1	**Compute** pressure at a point, pressure difference between two points from the given manometric liquid level in different manometers, hydrostatic force on submerged body, buoyant forces acting on submerged and floating body.
CO2	**Identify** whether a flow is steady or unsteady, uniform or non-uniform, Rotational or Irrotational, Laminar and Turbulent for the given velocity and acceleration fields and **develop** potential function and stream function from given velocity and acceleration field.
CO3	**Apply** Continuity equation, Euler's equation and Bernoulli's equation for estimating velocity of flow, discharge, head loss, and power required to pump for incompressible and inviscid flow.
CO4	**Explain** the working principle of flow measuring devices (pitot tube, venturi meter, orifice meter)
CO5	**Analyze** fully developed laminar for applying momentum equation and estimate friction factor, head loss due to friction, average velocity, center line velocity, shear stress, and pressure gradient for laminar viscous in a pipe, pipes connected in series and parallel, and between two parallel plates.
CO6	**Apply** the Pi theorem for performing dimensional analysis

Mapping of COs with Pos

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**3**	**1**	-	-	-	-	-	**1**	**1**	**1**	-	**1**
CO2	**3**	**1**	-	-	-	-	-	**1**	**1**	**1**	-	**1**
CO3	**3**	**1**	-	-	-	-	-	**1**	**1**	**1**	-	**1**
CO4	**3**	**1**	-	-	-	-	-	**1**	**1**	**1**	-	**1**
CO5	**3**	**1**	-	-	-	-	-	**1**	**1**	**1**	-	**1**

MATERIALS SCIENCE (ME181404)

Course Outcomes (COs) : At the end of the course, the student will be able to

CO1	Identify the XRD peaks and find the crystal structure and lattice parameter for a given X-ray diffraction (XRD) pattern for an elemental cubic material,
CO2	Illustrate the microstructure and the phases formed during solidification of the alloy for a given binary phase diagram.
CO3	Identify suitable heat treatment process for obtaining desired material properties in steels
CO4	Compute the tensile, hardness, impact and fatigue properties for a given material
CO5	Classify the various lattice imperfections and find critical resolved shear stress (CRSS) for a given slip system.
CO6	Explain the properties of alloying steels, cast iron, copper and copper alloys; brass, bronze and cupro-nickel; Aluminum and Al-Cu – Mg alloys- Nickel based super alloys and Titanium alloys

Mapping of COs with POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	-	-	-	-	-	1	1	1	-	1
CO2	2	2	--	--	--	--	--	1	1	1	--	1
CO3	2	1	-	-	-	-	-	1	1	1	-	1
CO4	3	2	-	-	-	-	-	1	1	1		1
CO5	2	1	-	-	-	-	-	1	1	1	-	1
CO6	2	-	-	-	-	-	-	1	1	1	-	1

MECHANICS OF MATERIALS (ME181405)

Course Outcomes (COs) : At the end of the course, the student will be able to

CO1	Explain stress-strain relationship for homogeneous and isotropic material under axial, torsional, flexural and combined loads
CO2	Compute principal stresses and strains and maximum shear stress using analytical and graphical methods.
CO3	Analyze radial, hoop and longitudinal stresses for thick cylinders under external and internal loading and analyze stresses in rotating discs.
CO4	Derive stresses in curved beam and estimate the stresses and deflection of helical spring under axial load.
CO5	Apply energy method to estimate the deflection and rotation of beams under flexural loading.

Mapping of COs with POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2		-	-	-	-	-	1	1	1	-	1
CO2	2	3	-	-	-	-	-	1	1	1	-	1
CO3	2	3	-	-	-	-	-	1	1	1	-	1
CO4	2	3	-	-	-	-	-	1	1	1	-	1
CO5	2	3	-	-	-	-	-	1	1	1	-	1

FLUID MECHANICS–I LAB [ME181413]

Course Outcomes (COs) : At the end of the course, the student will be able to

CO1	Investigate pressure variation, fluid behavior and losses along the flow through a circular pipe.
CO2	Test the validity of Bernoulli's theorem along a convergent divergent section
CO3	Determine co-efficient of discharge, co-efficient of contraction and co-efficient of velocity of flow through venturi meter and orifice meter.
CO4	Determine force exerted on flat plates by impact of jet.
CO5	Identify whether a flow is laminar or turbulent

Mapping of COs with POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**2**	**1**	-	-	-	-	-	**1**	**1**	**2**		**1**
CO2	**2**	**3**	-	-	-	-	-	**1**	**1**	**2**		**1**
CO3	**3**	-	-	-	-	-	-	**1**	**1**	**2**		**1**
CO4	**3**	-	-	-	-	-	-	**1**	**1**	**2**		**1**
CO5	**2**	**3**	-	-	-	-	-	**1**	**1**	**2**		**1**

MECHANICS OF MATERIALS LAB (ME181415)

Course Outcomes (COs) : At the end of the course, the student will be able to

CO1	Analyze failure of a given specimen under gradual application of uniaxial tensile load and determine tensile stress, Young's modulus, yield stress, ultimate stress, and percentage elongation.
CO2	Experiment and verify Hook's law, i.e. the relation between force and displacement with the help of a coil spring.
CO3	Compare actual and calculated shear force and bending moment developed in bending of beam under different loads.
CO4	Compute stiffness of different helical springs in both compression and tension.

Mapping of COs with POs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	-	-	-	-	1	2	1	-	1
CO2	2	3	-	-	-	-	-	1	2	1	-	1
CO3	2	3	-	-	-	-	-	1	2	1	-	1
CO4	2	3	-	-	-	-	-	1	2	1	-	1