



MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **MECHANICAL ENGINEERING**
GianiZail Singh Campus College of Engineering & Technology, MRSPTU

Program: M Tech Mechanical Engineering

COs, POs, PSOs Mapping

Subject: Advanced heat and mass transfer	Subject Code: MREM0-102	Semester: 1ST
Credit: 4	L T P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Analyze the analytical and numerical solutions for heat transfer problem.	3	2	1	-	-	--	1	-	3	1	2
CO2	able to solve problems related to convective and radiation heat transfer	3	1	1		1		1		2	1	1
CO3	Able to model multidimensional and transient heat transfer conditions	1	2	3						2	1	1
CO4	Able to analyses mass transfer problems	2	2	1						2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30% 2. Moderate (Medium) – above 30% and upto70% 3. Substantial (High) – above 70%



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Program: M Tech Mechanical Engineering

COs, POs, PSOs Mapping

Subject: Advanced Machine Design	Subject Code: MREM0-104	Semester: 1st
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand the review of machine design.	1	1	1	1	1	1	1	1	2	3	1
CO2	Learn about the concept of contact stresses.	1	1	1	1	1	1	1	1	3	2	3
CO3	Understand the concepts of fracture and creep in detail.	1	2	2	1	1	1	1	1	3	2	2
CO4	Understand about the concept of reliability.	1	2	2	2	1	1	1	1	3	2	3

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Program: **M Tech Mechanical Engineering**

COs, POs, PSOs Mapping

Subject: Composite Materials	Subject Code: MMEE2-156	Semester: 1st
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Learn the basics of composite materials and processing techniques	1	2	1	1	1	1	1	1	3	2	3
CO2	Understand Fabrication Methods.	1	2	2	1	1	1	1	1	2	2	3
CO3	Learn about the concept of laminated plates.	1	2	1	2	1	1	1	1	2	3	2
CO4	Understand the concept of Sandwich Constructions.	2	2	2	1	1	1	1	1	2	2	3

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COs, POs, PSOs Mapping

Subject: GAS DYNAMICS	Subject Code: MMEE8-157	Semester: 1st
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	To apply governing equations to practical problems involving compressible fluid flow.	2	1	2	2	1	1	1	-	3	1	2
CO2	To analyze compressible flow and normal shock through variable area duct critically.	1	2	1	2	1		1	-	2	1	2
CO3	To apply principles of fluid mechanics to propulsive system	1	1	1	1	1		1	-	2	1	1
CO4	To interpret propulsive systems for their working and application.	2	1	2	2	1	1	1	-	3	2	1
CO5	To apply governing equations to practical problems involving compressible fluid flow.	2	1	1			1			2	1	2

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Program: **M Tech Mechanical Engineering**

COs, POs, PSOs Mapping

Subject: :Research Methodology	Subject Code: MMEE0-101	Semester: 1st
Credit: 4	L T P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	The ability to formulate research problem using appropriate methods.	2	2	3	1	-	2	1	2	1	2	2
CO2	The ability to organize and conduct research in a more appropriate way	2	3	2	2	1	2	1	2	1	2	3
CO3	Develop skills in qualitative and quantitative data analysis and presentation	2	3	1	1	1	2	2	3	1	1	2
CO4	Demonstrate enhanced writing skills	1	1	2	1	2	3	3	1	-	3	2

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COs, POs, PSOs Mapping

Subject: : ADVANCE MANUFACTURING PROCESSES	Subject Code: MMEE2-103	Semester: 1st
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	To categorize different material removal, joining processes as per the requirements of material being used to manufacture end product.	1	1	1	1	1	1	1	1	3	2	3
CO2	To select material processing technique with the aim of cost reduction, reducing material wastage & machining time.	2	1	2	2	1	1	1	1	2	2	3
CO3	To identify the process parameters affecting the product quality in various advanced machining of metals/ non-metals, ceramics and composites.	1	1	2	1	1	1	1	1	2	3	3
CO4	To combine & develop novel hybrid techniques from the state of art techniques available.	3	3	3	3	2	1	1	1	2	3	3

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COs, POs, PSOs Mapping

Subject: : FINITE ELEMENT MODELLING	Subject Code: MMEE2-158	Semester: 1st
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand the concepts behind formulation methods in FEM.	1	1	1	1	1	1	1	1	3	3	3
CO2	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements.	2	1	2	2	1	1	1	1	2	3	2
CO3	Develop element characteristic equation and generation of global equation.	3	3	3	3	2	1	1	1	2	3	2
CO4	Able to apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi symmetric and dynamic problems and solve them displacements, stress and strains induced.	3	3	3	2	1	1	1	1	2	2	3

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COs, POs, PSOs Mapping

Subject: : Mechatronics	Subject Code: MMEE2-157	Semester: 1st
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Identification of key elements of mechatronics system and its representation in terms of block diagram	1	1	1	1	1	1	1	1	3	3	3
CO2	Development of PLC ladder programming and implementation of real life system.	3	3	2	3	2	1	1	1	3	3	3
CO3	Understanding the concept of signal processing and use of interfacing systems such as ADC, DAC, digital I/O	1	1	2	2	1	1	1	1	3	3	3
CO4	Interfacing of Sensors, Actuators using appropriate DAQ micro-controller	2	1	2	2	1	1	1	1	3	3	3

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COs, POs, PSOs Mapping

Subject: : LAB-1	Subject Code: MMEE2-105	Semester: 1st
Credit: 2	L T P: 4 0 0	Duration: 30 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Apply modern tools and skills in design and manufacturing to solve real world problems.	2	3	3	3	2	1	1	1	3	3	2
CO2	Apply managerial concepts and principles of management and drive global economic growth.	2	3	3	3	2	1	1	1	3	3	3
CO3	Apply thermal, fluid and materials fundamental knowledge and solve problem	2	3	3	3	2	1	1	1	3	3	3
CO4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data.	2	3	3	3	2	1	1	1	3	3	2

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COs, POs, PSOs Mapping

Subject: Advanced CAD/CAM	Subject Code: MMEE2-207	Semester: 2nd
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand advanced computer aided design techniques.	1	1	2						3	-	-
CO2	Learn to 2D Geometric transformations.	1	2	3						3	2	-
CO3	Understand the concepts representation of solids.	2	2	2						3	2	3
CO4	Understand about the concept reverse engineering.	2	2	2						3	3	3

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COs, POs, PSOs Mapping

Subject: Advanced Optimization Techniques	Subject Code: MMEE2-209	Semester: 2nd
Credit: 4	L T P: 4 0 0	Duration: 42 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	To apply the concept of linear and non-linear to solve problems	2	1	2	1	1	1	1	1	2	1	2
CO2	To solve problems related to Transportation and Assignment.	2	1	2	1	1	1	1	1	2	1	3
CO3	To apply the concept of queuing and network modeling	2	1	1	1	1	1	1	1	2	1	3
Co4	The ability to model the real problem of industry and society.	1	1	1	1	1	2	1	1	1	1	3

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COs, POs, PSOs Mapping

Subject: COMPUTATIONAL FLUID DYNAMICS	Subject Code: MMEE2-206	Semester: 2nd
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand and be able to numerically solve the governing equations for fluid flow	2	1	1	2		1	1		3	1	1
CO2	Understand and apply finite difference, finite volume and finite element methods to fluid flow problems	3	1	2			1			2	2	1
CO3	Generate and optimize the numerical mesh	2	2	2			1			1	1	3
CO4	Be able to numerically solve a heat transfer problem	1	1		2			1		1	1	3

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COs, POs, PSOs Mapping

Subject: Industrial Automation and Robotics	Subject Code: MMEE2-208	Semester: 2nd
Credit: 4	L T P: 4 0 0	Duration: 42 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Identify key elements of mechatronics system and its components.	1	1	1	1	1	1	1	1	1	1	-
CO2	Describe the working of automatic material handling system and workstations.	1	1	1	1	1	1	1	1	1	2	1
CO3	Understand the importance and application of various industrial controls in automation in industries	1	2	2	1	1	1	1	1	2	2	1
CO4	Understand simulated automation technology in industries.	1	2	2	1	1	1	1	1	2	2	1

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COs, POs, PSOs Mapping

Subject: Welding Metallurgy	Subject Code: MMEE2-260	Semester: 2nd
Credit: 4	L T P: 4 0 0	Duration: 41 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Student will be able to identify crystal structures for various materials and understand the defects in such structures.	1	1	1	1	1	1	1	1	3	3	2
CO2	Understand how to tailor material properties of ferrous and non-ferrous alloys.	1	1	1	1	1	1	1	1	3	3	3

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COs, POs, PSOs Mapping

Subject: LAB-II	Subject Code: MMEE1-210	Semester: 2nd
Credit: 2	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Students will be able to communicate, gain leadership qualities	1	1	1	1	1	1	3	1	2	1	2
CO2	Will be able to face actual problems in field	3	2	2	2	1	1	1	1	2	1	-
CO3	Will become responsible towards society	1	1	1	1	1	1	1	2	1	1	2
CO4	Will be able to solve specified need	3	2	2	1	1	1	1	1	-	1	1

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COs, POs, PSOs Mapping

Subject: Maintenance and Reliability Engineering	Subject Code: MMEE2-311	Semester: 3rd
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand the fundamental principles, functions adapted in industry for the successful management of maintenance and reliability activities.	2	1	2		1				1	-	2
CO2	Understand the strategic role of Maintenance/Reliability engineering in asset life cycle optimization	2	2	2	1	2				1	2	3
CO3	Identify and apply appropriate maintenance strategy	3	1	2		2				1	2	3
CO4	Apply analytical skills and problem-solving tools/techniques to the fault analysis of various machines and equipment	2	2	1	2	2				1	2	3

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COs, POs, PSOs Mapping

Subject: Total Quality Management	Subject Code: MMEE2-312	Semester: 3rd
Credit: 4	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand the fundamental principles of Total Quality Management and its tools.	2	-	3	2	2	2	-	2	1	2	2
CO2	Apply appropriate statistical techniques for improving processes in terms of quality.	2	2	3	2	2	2	1	1	1	3	3
CO3	An understanding of the impact of workforce on quality management.	2	1	1	3	2	-	2	2	-	-	2
CO4	Ability to use knowledge to solve quality related problems.	1	2	2	2	2	-	-	1	-	2	3

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COs, POs, PSOs Mapping

Subject: PROJECT & SEMINAR	Subject Code: MMEE2-313	Semester: 3rd
Credit: 4	L T P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Undertake problem identification, formulation and solution.	2	1	1	1	1	1	1	1	3	3	3
CO2	Design engineering solutions to complex problems utilising a systems approach.	2	1	1	2	1	1	2	1	3	3	3
CO3	Communicate with engineers and the community at large in written and oral form.	1	1	1	2	1	1	3	1	2	3	2
CO4	Demonstrate the knowledge, skills and attitudes of a professional Engineer.	1	1	1	2	1	2	2	1	2	3	3

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COs, POs, PSOs Mapping

Subject: Final Thesis	Subject Code: MMEE2-415	Semester: 3rd
Credit: 20	LT P: 4 0 0	Duration: 40 hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Demonstrate a depth of knowledge of Mechanical Engineering	2	3	3	-	1	3	2	2	3	2	2
CO2	Complete an independent research project, resulting in at least a research outputs in terms of publications in high impact factor journals, conference proceedings, and patents.	1	2	2	-	1	3	2	1	-	3	2
CO3	Demonstrate knowledge of contemporary issues in their chosen field of research.	2	2	3	-	-	2	-	2	1	2	2
CO4	Demonstrate an ability to present and defend their research work to the panel of experts.	2	3	2	-	1	3	3	-	-	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30% 2. Moderate (Medium) – above 30% and upto70% 3. Substantial (High) – above 70%