

**SUBJECT CODE: MPE-101**

**SUBJECT NAME: ADVANCED METAL FORMING**

**On completion of the course, the student will have the ability to:**

Sr. No.	Course Outcomes (Cos)
1	understand and apply the mechanism of deformation for different metal forming processes and develop analytical relation between input and output parameters of process.
2	analyze the heat generation and heat transfer mechanism due to friction and deformation during various metal forming processes.
3	understand and analyze the concept of yield criteria applicable to different material deformation processes
4	apply theoretical and experimental techniques for measurement of important outcomes of metal forming processes
5	understand the different lubrication mechanisms, lubricants and other valuable affecting the metal forming processes under different working conditions
6	understand the different types of defects, causes and apply their remedial measures in metal forming processes

**SUBJECT CODE: MPE-102**

**SUBJECT NAME: ADVANCED METAL CASTING**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	understand and apply the principles of metal casting processes and develop analytical relation between input and output process parameters
2	understand, analyze and apply the concept of cooling rate of materials in metal casting
3	apply theoretical and experimental techniques for measurement of important outcomes of casting processes like hardness, dimensional accuracy etc.
4	understand the model of casting economics and optimization and its measurement
5	apply the fundamentals of physics to develop theoretical relations for different types of casting processes
6	Understand principles of destructive and non-destructive testing for casting defects

**SUBJECT CODE: MPE-105**

**SUBJECT NAME: ENTREPRENEURSHIP**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	evaluate the project appraisal reports
2	design and analyse the risk associated with a new project
3	evaluate and improve the existing project
4	study and implementation of government policies
5	design technical and financial reports
6	judge and evaluate the creativity and entrepreneurial properties of individual

**SUBJECT CODE: MPE-106**

**SUBJECT NAME: JIG FIXTURE & PRESS DESIGN**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	design jigs for different jobs and products
2	design Fixture for different jobs and products
3	evaluate the economics of designing of jigs and fixtures

4	study advancements in designing of jigs and fixtures
5	design Dies and die components
6	design and evaluate forming dies and equipment's

**SUBJECT CODE: MPE-107**

**SUBJECT NAME: ADVANCE PLANT LAYOUT DESIGN**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	design Systematic an Industrial Plant
2	evaluate the site locations and factors effecting the plant layouts
3	design material handling system of Plant
4	study and evaluate different types of material equipment's
5	evaluate different maintenance techniques used in running effective plant
6	design and evaluate different safety norms

**SUBJECT CODE: MPE- 108**

**SUBJECT NAME: PRODUCT DESIGN AND DEVELOPMENT**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	analyze, evaluate and apply the methodologies for product design, development and management.
2	understand the technical and business aspects of the product development process.
3	apply creative process techniques in synthesizing information, problem-solving and critical thinking.
4	use basic fabrication methods to build prototype models for hard-goods and soft-goods and packaging.
5	skilled in implementation of gathering data from customers and establish technical specification
6	apply technique of PDD Manufacturing.

**SUBJECT CODE: MPE- 109**

**SUBJECT NAME: ADDITIVE MANUFACTURING PROCESS AND APPLICATIONS**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	define the various process used in Additive Manufacturing.
2	analyze and select suitable process and materials used in Additive Manufacturing.
3	identify, analyze and solve problems related to Additive Manufacturing.
4	apply knowledge of additive manufacturing for various real-life applications.
5	apply technique of CAD and reverse engineering for geometry transformation in Additive Manufacturing.
6	do selection of AM technologies using decision methods

**SUBJECT CODE: MPE-110**

**SUBJECT NAME: FLEXIBLE MANUFACTURING SYSTEMS**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	classify and distinguish FMS and other manufacturing systems including job-shop and mass production systems.
2	explain processing stations and material handling system used in FMS environments.
3	design and analyze FMS using simulation and analytical techniques.

4	understand tool management in FMS.
5	analyze the production management problems in planning, loading, scheduling, routing and breakdown in a typical FMS.
6	understand the Machine Computer Interface

**SUBJECT CODE: LMPE-101**

**SUBJECT NAME: ADVANCED MANUFACTURING PROCESSES LABORATORY**

**On Completion of the course, the student will have the ability to:**

CO#	Course Outcomes(CO)
1	analyze the working of various advanced manufacturing processes
2	understand the advantages and limitations of advanced manufacturing processes
3	evaluate performance of various components involved in advanced manufacturing processes
4	check the proper working of various advanced manufacturing processes
5	measure/determine the changes in the output due to change in certain input conditions
6	explain the phenomenon of various advanced manufacturing processes

**SUBJECT CODE: LMPE-102**

**SUBJECT NAME: ADVANCED MACHINING AND CASTING PROCESSES LABORATORY**

**On Completion of the course, the student will have the ability to:**

CO#	Course Outcomes(CO)
1	analyze the working of various advanced machining and casting processes
2	understand the advantages and limitations of advanced machining and casting processes
3	evaluate performance of various components involved in advanced machining and casting processes
4	check the proper working of various advanced machining and casting processes
5	measure/determine the changes in the output due to change in certain input conditions
6	explain the phenomenon of various advanced machining and casting processes

**SUBJECT CODE: MRM-101**

**SUBJECT NAME: RESEARCH METHODOLOGY AND IPR**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	understand research problem formulation.
2	analyse research related information.
3	follow research ethics.
4	understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
5	understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
6	understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

**SUBJECT CODE: MAC-105**

**SUBJECT NAME: CONSTITUTION OF INDIA**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.

2	discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
3	discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
4	discuss the passage of the Hindu Code Bill of 1956.

**SUBJECT CODE: MPE-103**

**SUBJECT NAME: ADVANCED WELDING PROCESSES**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	understand and apply the principles of welding processes and develop analytical relation between input and output process parameters
2	understand, analyze and apply the concept of cooling rate of materials in welding
3	apply theoretical and experimental techniques for mode of metal transfer
4	understand the concept of forces acting on welding arc and arc efficiency
5	apply the fundamentals of physics to develop theoretical relations for different types of welding processes
6	understand principles of destructive and non-destructive testing for welding defects

**SUBJECT CODE: MPE-104**

**SUBJECT NAME: ADVANCED METAL CUTTING**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	understand and design tool geometry of the basic cutting tools like single point cutting tool, drills etc.
2	solve the problems related with the measurement of cutting forces, tool wear and should be able to deal with various parameters effectively.
3	measure and improve tool life of various cutting tools.
4	simulate various machining processes and apply economics of machining.
5	understand the different types of defects, causes and apply their remedial measures in metal cutting processes.
6	develop economics of metal machining and abrasive machining.

**SUBJECT CODE: MPE-111**

**SUBJECT NAME: PRODUCTION AND INVENTORY CONTROL**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	describe and analyze distinct concepts within production planning and explain how these can be used to plan and control the physical flow of information and products in the production companies.
2	know about business forecasting and market survey in the dynamic environment.
3	schedule production by using different techniques and evaluate different capacity alternatives/strategies to meet the customer demand.
4	know about inventory control techniques and evaluate different inventory alternatives/ strategies.
5	Know about the concepts of JIT-I and JIT-II.
6	demonstrate and apply the concept of Value Engineering.

**SUBJECT CODE: MPE-112**

**SUBJECT NAME: QUALITY ASSURANCE**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	demonstrate and apply the concept Inspection in an industrial organization.
2	develop in-depth knowledge of quality control and management.
3	develop in-depth knowledge on various aspects of quality management systems

4	apply various quality controls tools in the industries to enhance the quality.
5	develop analytical skills for investigating and analyzing quality management issues in the industry and suggest implementable solutions to those.
6	explain the concept of reliability.

**SUBJECT CODE: MPE-113**

**SUBJECT NAME: ADVANCED INDUSTRIAL TRIBOLOGY**

**On completion of the course, the student will have the ability to:**

<b>Sr. No.</b>	<b>Course Outcomes (Cos)</b>
1	understand the mechanism of friction, wear and lubrication and analytical relation between variables
2	understand the concept of types of wear and their measurement under different environments
3	understand the laws and mechanism of sliding and rolling friction
4	understand the mechanism of lubrication, their performance with respect to different variables
5	apply these mechanisms of tribology in the design of different types of bearings considering various input and output parameters
6	apply the applications of solid lubricants in various metal forming processes depending upon their characteristics.

**SUBJECT CODE: MPE-114**

**SUBJECT NAME: INDUSTRIAL ROBOTIC DESIGN**

**On completion of the course, the student will have the ability to:**

<b>CO#.</b>	<b>Course Outcomes (Cos)</b>
1	identify potential areas for automation and justify need for automation
2	select suitable major control components required to automate a process or an activity
3	translate and simulate a real time activity using modern tools and discuss the benefits of automation.
4	explain the basic principles of Robotic technology, configurations, control and programming of Robots.
5	design an industrial robot which can meet kinematic and dynamic constraints.
6	choose the appropriate Sensor and Machine vision system for a given application.

**SUBJECT CODE: MPE-115**

**SUBJECT NAME: NON-CONVENTIONAL MACHINING PROCESS**

**On completion of the course, the student will have the ability to:**

<b>CO#.</b>	<b>Course Outcomes (Cos)</b>
1	understand the evolution, classification and need of nontraditional machining technology
2	understand and demonstrate the process principle and physical description; apply the parametric effect on process performance; solve problems related to process modeling, selection and material removal mechanics of mechanical energy based processes
3	understand and demonstrate the process principle and physical description; apply the parametric effect on process performance; solve problems related to process modeling, selection and material removal mechanics of thermal and electro-thermal energy based processes
4	understand and demonstrate the process principle and physical description; apply the parametric effect on process performance; solve problems related to process modeling, selection and material removal mechanics of chemical and electro-chemical energy based processes

5	access possibilities for hybrid nontraditional machining processes
6	apply the applications of various non-conventional processes in appropriate field by considering their advantages and disadvantages.

**SUBJECT CODE: MPE-116**

**SUBJECT NAME: COMPUTER AIDED DESIGN**

**On completion of the course, the student will have the ability to:**

<b>CO#.</b>	<b>Course Outcomes (Cos)</b>
1	describe the role of computer systems in design and manufacturing.
2	understand and create geometric models by using various techniques of geometric modeling.
3	apply geometric transformations on different models entities.
4	describe the key concept of NC/CNC/DNC.
5	create and validate NC part program data using manual data input.
6	evaluate integration of CAD/CAM and business aspects in an industry.

**SUBJECT CODE: LMPE-103**

**SUBJECT NAME: ADVANCED WELDING PROCESS LABORATORY**

**On Completion of the course, the student will have the ability to:**

<b>CO#</b>	<b>Course Outcomes(CO)</b>
1	analyze the working of various advanced welding processes
2	understand the advantages and limitations of advanced welding processes
3	evaluate performance of various components involved in advanced welding processes
4	check the proper working of various advanced welding processes
5	measure/determine the changes in the output due to change in certain input conditions
6	explain the phenomenon of various advanced welding processes

**SUBJECT CODE: LMPE-104**

**SUBJECT NAME: MECHANICAL AND MORPHOLOGICAL CHARACTERIZATION LABORATORY**

**On Completion of the course, the student will have the ability to:**

<b>CO#</b>	<b>Course Outcomes(CO)</b>
1	analyze the working of various mechanical testing
2	understand the advantages and limitations of tensile testing
3	evaluate performance of various components involved in morphological testing
4	understand the working of metallurgical microscope
5	understand destructive/ non-destructive methods for characterization
6	explain the phenomenon of deformation via morphological characterization

**SUBJECT CODE: MAC-106**

**SUBJECT NAME: PEDAGOGY STUDIES**

**On completion of the course, the student will have the ability to understand:**

<b>CO#.</b>	<b>Course Outcomes (Cos)</b>
1	what pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
2	what is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?

3	how can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
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**SUBJECT CODE: MPE-117**

**SUBJECT NAME: OPERATIONS MANAGEMENT**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	Explain the scope and function of operations management.
2	develop the functions of work and job design, facility and capacity planning.
3	apply Production Planning and Control and maintenance management in the dynamic environment of an organization.
4	apply the concept of Quality assurance in an organization.
5	analyze distinct concepts within value engineering and explain how these can be used in materials and products in Industries.
6	demonstrate purchasing, store management and inventory control techniques and evaluate different inventory alternatives/strategies.

**SUBJECT CODE: MPE-118**

**SUBJECT NAME: MATERIALS MANAGEMENT**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	explain the scope and function of material management.
2	develop the functions of purchasing, inventory management and receiving & shipping.
3	apply business functions in the dynamic environment.
4	explain inventory control techniques and evaluate different inventory alternatives/strategies
5	analyze distinct concepts within material management and explain how these can be use materials and products in Industries.
6	apply the concept of store management in an organization.

**SUBJECT CODE: MPE-119**

**SUBJECT NAME: ADVANCE OPERATIONS RESEARCH**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	analytical use methods such as mathematical programming, queuing theory, multi criteria analysis which are helpful in assessing the various practical problems with the appropriate logical structure.
2	enhance the skill of Postgraduate students in clarifying critical data elements and their role as model inputs.
3	solve the networking problems in various projects which are time dependent
4	enhance the Decision making process of engineering on the basis of mathematical modeling
5	evaluate different alternatives of Transportation and Assignment Models
6	design and evaluate different simulation techniques

**SUBJECT CODE: MPE-120**

**SUBJECT NAME: INDUSTRIAL SAFETY**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	explain the basic terminology, legislation and standards involved in Industrial Safety.

2	recognising the factors contributing towards Industrial Hazards and Accidents.
3	apply various preventive measures to ensure Industrial Safety.
4	demonstrate the concept of Wear and Corrosion and their prevention.
5	identify of faults in machine tools and their general causes
6	demonstrate the concept of Periodic and preventive maintenance.

**SUBJECT CODE: MPE-121**

**SUBJECT NAME: OPERATIONS RESEARCH**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	apply the dynamic programming to solve problems of discrete and continuous variables.
2	apply the concept of non-linear programming.
3	carry out sensitivity analysis.
4	model the real world problem and simulate it.

**SUBJECT CODE: MPE-122**

**SUBJECT NAME: COMPOSITE MATERIALS**

**On completion of the course, the student will have the ability to:**

CO#.	Course Outcomes (Cos)
1	identify, describe and evaluate the properties of fibre reinforcements, polymer matrix materials and commercial composites.
2	develop competency in one or more common composite manufacturing techniques, and be able to select the appropriate technique for manufacture of fibre-reinforced composite products.
3	analyse the elastic properties and simulate the mechanical performance of composite laminates; and understand and predict the failure behaviour of fibre-reinforced composites.
4	apply knowledge of composite mechanical performance and manufacturing methods to a composites design project
5	critique and synthesise literature and apply the knowledge gained from the course in the design and application of fibre-reinforced composites.