Department of Production Engineering
GURU NANAK DEV ENGINEERING COLLEGE, LUDHIANA

BACHELOR OF TECHNOLOGY

MECHANICAL ENGINEERING

(PRODUCTION ENGINEERING) 2018

Course Outcomes

Subject Code:PCPE-101

Subject Name: Strength of Material

CO#.	**Course Outcomes (Cos)**
1	Execute the fundamental concepts of stress, strain and elastic behaviour of materials to analyse structural members subjected to tension, compression and torsion.
2	Analyze the bending stress on different types of sections.
3	Formulate appropriate theoretical basis for the analysis of combined axial and bending stresses.
4	Understand the behaviour of column and struts under axial loading.
5	Demonstrate the use of critical thinking and problem solving techniques as applied to structural systems.
6	To predict the deflection in beams of varying sections and different materials.

Subject Code: PCPE-102

Subject Name: Machine Drawing

CO#.	**Course Outcomes**
1	Read, draw and interpret the machine drawings and related parameters.
2	Understand and monitor the manufacturing of components at shop floor level as per the information in the given drawing.
3	Understand the concept of limits, fits and tolerances in various mating parts.
4	Visualize and generate different views of couplings and joints.
5	Visualize and generate different views of a component with detailed internal information in the assembly and disassembly.
6	Draw the various components on the computer aided drafting software's.

Subject Code: PCPE-103

Subject Name: Thermal Engineering

CO#	**Course Outcomes(CO)**
1	An ability to identify, track and solve various combustion problems.
2	An ability to recognize and understand the working of devices involved in thermal plants
3	An ability to evaluate theoretically the performance of various components involved in steam power plants and reciprocating compression machines.
4	An ability to design some components working on non-conventional power sources
5	An ability design machines based on heat transfer phenomenon.
6	An ability to understand and interpret the working of various engines and generators.

Subject Code: HSMPE-101

Subject Name: Operation Management

CO#	**Course Outcomes(CO)**
1	An ability to apply knowledge of mathematics, science, and engineering
2	An ability to design and conduct experiments, as well as to analyze and interpret data.
3	An ability to design a system, process to meet desired needs within realistic constraints.
4	An ability to function on multidisciplinary teams.
5	An Ability to design and maintain the systems
6	An ability to plan, control and execute the different duties in an organization

Subject Code: BSPE-101

Subject Name: Material Science

CO#	**Course Outcomes(CO)**
1	Apply knowledge of Crystal growth, Crystal structure, re-crystallization in various manufacturing processes.
2	Understand the reasons of deformations in crystals.
3	Acknowledge the various applications of different types of materials.
4	Determine the crystal structure of simple crystals.
5	Recognize the crystal defects during manufacturing and their respective remedies.
6	Apply knowledge about the various material properties for different engineering applications.

Subject Code: ESPE-101

Subject Name: Industrial Engineering

CO#	Course Outcomes(CO)
1	An ability to apply knowledge of mathematics, science, and engineering
2	An ability to design and conduct analyze and interpret data.
3	An ability to plan and design layouts of an organization with an eye on enhancements..
4	An ability to function on multidisciplinary teams.
5	An ability evaluate the economic aspects of an organization.
6	An ability to design and implement the work and jobs in an organization.

Subject Code: LPCPE-101

Subject Name: Strength of Material Lab

CO#	Course Outcomes(CO)
1	Perform tensile and compression test.
2	Knowledge of bending test on beam.
3	Perform torsion test and determine modulus of rigidity.
4	Understand study and compute various hardness test.
5	Perform shear test and determine ultimate shear strength.
6	Perform impact test and determine impact strength.

Subject Code: LPCPE-102

Subject Name: Thermal EngineeringLab

CO#	Course Outcomes(CO)
1	An ability to identify, track various combustion problems in I.C. engines.
2	An ability to recognize and understand the working of devices operating on the principles of Heat Transfer.
3	An ability to evaluate practically the performance of various components involved in steam power plants and reciprocating compression machines.
4	An ability to design some components working on non-conventional power sources
5	An ability determine the C.O.P. of various machines like refrigerator, air conditioner etc.
6	An ability to understand and interpret the working of various industrial boilers

Subject Code: PCPE-104

Subject Name: Design of Machine Elements

CO#	Course Outcomes(CO)
1	To understand the design flow chart for existing and new conceptual design.
2	Deal with the machine design problems in technical way using design principles and procedures.
3	Understand different stresses and strains (loading conditions), and also effect of these stresses and strains on different machine members.
4	To deal with problems of designing various types of joints and other important machine elements in a technical way.
5	Will be able to analyze the design and recommend/apply appropriate adjustments in the existing design.
6	To manage Design of machine components like: springs, flywheel, clutches and brakes etc. according to various necessities in the business/Industry.

Subject Code: PCPE-105

Subject Name: Fluid Mechanics & Machinery

CO#	Course Outcomes(CO)
1	An ability to solve problems relating to kinematic and dynamics of fluid flow.
2	An ability to analyze the fluid dynamic conditions and in assessing the equations involved on the basis of dimensional homogeneity.
3	An ability to evaluate theoretically the performance of various components involved in pumps and turbines.
4	An ability to check the homogeneity of various equations involved in fluid mechanics.
5	An ability to solve various problems arising in fluid working machinery.

Subject Code: PCPE-106

Subject Name: Manufacturing Processes

CO#	Course Outcomes(CO)
1	An ability to identify various equipment's required the casting and welding processes.
2	An ability to test the products made by casting and welding processes

3	An ability to apply the knowledge for practical use & application of manufacturing processes
4	An ability to understand the various process parameters involved in different Manufacturing Processes
5	Implement appropriate machining processes effectively and economically.
6	Design newer combinations of different processes of machining, machining parameters, tool material &shape to enhance the tool life.

Subject Code: PCPE-107

Subject Name: Kinematics & Dynamics of Machine

CO#	Course Outcomes(CO)
1	Understand the working of various primitive components of a machine.
2	Develop mathematical skills for the computation of industry related problems.
3	Determine the various physical parameters of power transmission devices, friction devices and different governing devices.
4	Compute the essential parameters like fluctuation of speed and energy in a flywheel of a vehicle, slotting machine etc.
5	Understand the function of belt drives, cams, flywheels and governors and solve related problems
6	Understand the capacity and use of gears in machines and the concept of gyroscopic couple and its impact in ships, planes, two wheeler and four wheeler.

Subject Code: PCPE-108

Subject Name: Physical Metallurgy and Heat Treatment

CO#	Course Outcomes(CO)
1	Explain crystallography, deformations and re-crystallization in various crystal structures and their effect on the properties of metals.
2	Use various techniques to check microstructure and mechanical properties of materials.
3	Implement various heat treatment processes to enhance the properties of materials.
4	Build new alloys with different structures and properties by altering composition of various alloying elements.
5	Analyze the various transformations in equilibrium phase diagrams.
6	Figure out at which temperatures various transformations in phase diagrams become stable.

Subject Code: LPCPE-103

Subject Name: Fluid Mechanics & Machinery Lab

CO#	Course Outcomes(CO)
1	An ability to analyze the working of various fluid flow measurement devices.
2	An ability to determine the various losses in the fluid flow under different working conditions.
3	An ability to evaluate practically the performance of various components involved in pumps and turbines.
4	An ability to check the proper working of various turbines and pumps.
5	An ability to measure/determine the changes in the fluid properties due to change in certain conditions.
6	An ability to explain the phenomenon of fluid flow in various types of flows.

Subject Code: LPCPE-104

Subject Name: Kinematics and Dynamics of Machine Lab

CO#	Course Outcomes(CO)
1	Understand the working of different types of link motions and mechanisms.
2	Understand the working and application of gears and gear trains.
3	Understand the working and application of brakes and clutches.
4	Compute the essential parameters of quick return mechanisms and their application.
5	Understand the function and application of cams,flywheels and belts.
6	Understand the capacity and use of dynamometers.

Subject Code: LPCPE-1065

Subject Name: Manufacturing Processes Lab & Physical Metallurgy & Heat Treatment Lab

CO#	Course Outcomes(CO)
1	To apply this knowledge for practical use and application of manufacturing processes in the industries.
2	To understand the various process parameters involved in different machining

	processes.
3	To understand the essential components of casting and welding processes.
4	Understand the crystal structures and microstructure of materials.
5	Know about the effect of quenching medium and effect of annealing time on mechanical properties of steel.
6	Recognize the various phases of Fe-C diagram and effect of cooling rate in formation of Austenite, bainite, martensite and pearlite.

SUBJECT CODE: PCPE-109

SUBJECT NAME: INDUSTRIAL AUTOMATION & ROBOTICS

CO#	**Course Outcomes COS**
1	Contribution of automation to the industry.
2	To differentiate between components of hydraulic and pneumatic systems.
3	Use of Hydraulics & Pneumatics circuits to meet functionality requirements of products.
4	Understand about various types of electrical and electronic controls for industrial applications.
5	To understand the basics of robots thoroughly this will help them to program
6	About applications of robots in industries

SUBJECT CODE: PCPE-110

SUBJECT NAME: INSPECTION & QUALITY CONTROL

CO#.	**Course Outcomes COS**
1	Demonstrate and apply the concept of Inspection in an industrial organization.
2	Develop in-depth knowledge of quality and management.
3	Apply various quality controls tools in the industries to enhance the quality.
4	Develop analytical skills for investigating and analyzing quality management issues in the industry and suggest implementable solutions to those.
5	Explain the concept of process capability.
6	Develop in-depth knowledge on various aspects of quality management systems

SUBJECT CODE: PCPE-111

SUBJECT NAME: METAL FORMING

CO#.	**Course Outcomes COS**
1	Demonstrate and correlate the theory of metal forming with the actual processes in the industry.
2	Develop in-depth knowledge of lubrication and its mechanisms.
3	Understand the state of stress in various metal forming processes.
4	Develop analytical skills for investigating and analyzing metal deformation in various forming processes.
5	Explain and utilize different analytical methods such as finite element analysis, upper bound method.
6	Develop better models of manufacturing using metal forming techniques..

SUBJECT CODE: PCPE-112

SUBJECT NAME: ENGINEERING METROLOGY

CO#.	**Course Outcomes COS**
1	Understand the concept of tolerances and gauge design.
2	Use the various types of measuring instruments according to the specific requirements along with the knowledge of their working principles.
3	Measure and testing of different types of gears.
4	Familiarize with the working of optical measuring instruments
5	Utilize transducers for various measurements.
6	Measure pressure, torque and force using different techniques.

SUBJECT CODE: PCPE-113

SUBJECT NAME: MACHINING SCIENCE

CO#.	**Course Outcomes COS**
1	Demonstrate and apply the concepts of machining.
2	Develop in-depth knowledge of tool geometry and tool life.
3	Apply various metal cutting theory in the industries to enhance the quality and reduce the cost of manufacturing..
4	Develop analytical skills for investigating and analyzing tool wear and tool failure.
5	Explain and utilize the concept of machinability.
6	Develop an economical model of machining.

SUBJECT CODE: LPCPE-106

SUBJECT NAME: INDUSTRIAL AUTOMATION & ROBOTICS LABORATORY

CO#.	**Course Outcomes COS**
1	Undertake kinematics analysis of robot manipulators.
2	Describe different mechanical configurations of robot manipulators.

3	To differentiate between components of hydraulic and pneumatic systems.
4	Have an understanding of the functionality and limitations of robot actuators.
5	To differentiate between components of hydraulic and pneumatic control systems
6	Use of Hydraulics & Pneumatics circuits to meet functionality requirements of products.

Detailed Contents:

CODE: LPCPE-107

SUBJECT NAME: METAL FORMING & MACHINING SCIENCE LABORATORY

CO#.	Course Outcomes COS
1	Measure the torque, and thrust in various machining operations.
2	Use the tool work thermocouple for determining tool chip interface temperature.
3	Determine tool wear and tool life of a machining tool.
4	Determine the coefficient of friction in various metal forming processes.
5	Estimate the load required for plastic deformation of material.
6	Develop an experimental setup to calculate the effect of various parameters in various machining and metal forming processes.

SUBJECT CODE: LPCPE-108

SUBJECT NAME: ENGINEERING METROLOGY LABORATORY

CO#.	Course Outcomes COS
1	Use tool makers microscope and profile projector
2	Use the various types of measuring instruments according to the specific requirements along with the knowledge of their working principles.
3	Measure and testing of different types of gears.
4	Familiarize with the working of optical measuring instruments
5	Utilize the slip gauges and comparators
6	Calibrate a gauge and measure pressure and force using different techniques.

SUBJECT CODE: PCPE-114

SUBJECT NAME: INDUSTRIAL TRIBOLOGY

CO#.	Course Outcomes COS
1	Understand the various theoretical concepts of tribology and co-relate the same with actual processes in industry.
2	Enable to understand the laws of various types of friction and measurement of the same practically.
3	Enhance the knowledge of different laws of wear and measurement of the same practically in various environmental conditions.
4	Understand the prevention and control of wear and friction by using different mechanisms of lubrication.
5	Suggest better lubricants depending upon the physical and environmental conditions.
6	Enable to design the tribological components (bearings) with respect to the required conditions.

SUBJECT CODE: PCPE-115

SUBJECT NAME: MACHINE TOOL DESIGN

CO#.	Course Outcomes COS
1	Understand the various requirements of the machines.
2	Access the various feed drives and spindle drives design on the basis of varying load conditions.
3	Enhance the knowledge regarding the manufacturing aspects of the machining.
4	Get equipped with the knowledge of machine tool dynamics.
5	Evaluate the purpose and principal of tool geometry, construction and design.
6	Access machine tools control system which will further help in recognizing the different operational conditions on the machine.

Subject Code: PCPE-116

Subject Name: Operation Research

CO#.	Course Outcomes COS
1	Student will be able to define an organization problem including specifying the objectives and parts of the system that must be analyzed before the problem is solved. Student will be able to industrial and business problems by using Linear Programming Models
2	Student will be able to apply the knowledge of Transportation and Travelling Salesman Problems in practical life to reduce the costs
3	Student will be able to collect assign jobs and work in industrial and service organizations
4	Student will be able to develop a mathematical model of the solving the queuing problems in industries, toll plazas, offices and malls.
5	Student will be able to prepare different strategies of industries or business organizations based upon the market competition.
6	Student will be able to develop and analyze the projects.

SUBJECT CODE: PCPE-117

SUBJECT NAME: NON TRADITIONAL MACHINING

CO#.	Course Outcomes COS
1	Detailed study about advanced machining processes and their applications..
2	Describe principles of nontraditional machining processes and differences of same with conventional machining processes.
3	Apply material removal mechanisms in various non-conventional machining processes.
4	Develop in-depth knowledge on applications of non-traditional process in industry.
5	Explain the concept of material removal rates in processes like Ultrasonic machining and Abrasive Flow Machining, Abrasive Water Jet Machining, Electrochemical Machining.
6	Develop in-depth knowledge on various aspects of Thermal metal removal processes.

SUBJECT CODE: LPCPE-109

SUBJECT NAME: INDUSTRIAL TRIBOLOGY AND MACHINE TOOL DESIGN LAB.

CO#.	Course Outcomes COS
1	Enable to use Pin on Disk apparatus to know the tribological properties of various materials under different environmental conditions.
2	Enable to use Air-Jet Erosion tester apparatus to know the tribological properties of various materials under different environmental conditions.
3	Enable to use Slurry Erosion tester apparatus to know the tribological properties of various materials under different environmental conditions
4	Familiarize with construction of kinematic diagrams using tracing paper method/ CAD software.
5	Enhance the ability to draw Gearing Diagrams of various machines.
6	Familiarize with speed chart, ray diagram and gearing diagram to determine the number of teeth on gears.

SUBJECT CODE: LPCPE-110

SUBJECT NAME: Non Traditional Machining Laboratory

CO#.	Course Outcomes COS
1	Students will be able to perform experimental study on Ultrasonic Machine
2	Students will be able to perform experimental study on Abrasive Jet Machine
3	Students will be able to perform experimental study on Electro Discharge Machine
4	Students will be able to perform experimental study on Electro Chemical Machine
5	Students will be able to know the process parameters of different non-conventional machining processes
6	Students will be able to know calculate MRR Surface Textures and Properties of Materials Machined by different non-conventional machining processes

Subject Code: PEPE-101

Subject Name: Jig Fixture & Die Design

CO#	Course Outcomes(CO)
1	To Design jigs for different jobs and products
2	To Design Fixture for different jobs and products
3	To evaluate the economics of designing of jigs and fixtures
4	Study advancements in designing of jigs and fixtures
5	To design Dies and die components
6	To design and evaluate forming dies and equipments

SUBJECT CODE: PEPE-102

SUBJECT NAME: TOOL AND CUTTER DESIGN

CO#.	Course Outcomes COS
1	Demonstrate the principle elements of cutting tools and tool geometry.
2	Evaluate the design elements and geometrical parameters of the tool life.
3	Develop in-depth knowledge of Twist drill geometry, construction and design.
4	Do analysis of correct profile of Form tools.
5	Explain the problems related to measurement of Milling and Broaching.
6	Explain the problems related to measurement of Reamers.

SUBJECT CODE: PEPE-103

SUBJECT NAME: INTRODUCTION TO ROBOTICS

CO#.	Course Outcomes COS
1	Demonstrate the basic concepts of robotics, their classification and structure.
2	Explain the type of the drive and control systems used in robotics.
3	Describe the type of sensors used in robotics.
4	Perform the robot language programming.
5	Elucidate the need and implementation of related Instrumentation & control in robotics
6	Illustrate the Kinematics and Dynamics of robotics

SUBJECT CODE: PEPE-104

SUBJECT NAME: MICRO MACHINING

CO#.	Course Outcomes COS
1	Demonstrate the concept of Micro machining in a manufacturing unit.
2	develop in-depth knowledge of latest technologies in micro machining like DTM, AJMM, FIB Machining etc.
3	Develop in-depth knowledge of concept of Micro Metrology.
4	Explain the concept of Micro-Electric Discharge and Electro Chemical Micromachining.
5	Develop skills to fabricate products using micro machining efficiently.
6	Apply the techniques of Micro machining in a manufacturing unit.

Subject Code: PEPE-125

Subject Name: Human Engineering

CO#.	Course Outcomes COS
1	Student will be able to analysis the psychology of human behavior as it relates to workplace safety.
2	Student will be able to identify ergonomic hazards, recommend appropriate controls.
3	Student will be able to analysis the anatomical and mechanical structure of the human body and anthropometry techniques available to engineers.
4	Student will be able to analysis the concept of the office workstation & ergonomic design of the office workstation.
5	Student will be able to investigate human senses in general and special focus on the vision sense and the auditory sense.
6	Student will be able to analysis the work related disorders & industrial safety aspects.

Subject Code: PEPE-126

Subject Name: Agile manufacturing

CO#.	Course Outcomes COS
1	Understand conceptual frame work of agile manufacturing environment.
2	Get insight into Enterprise design process, apply interdisciplinary design concepts.
3	Develop characteristic difference between lean manufacturing and agile manufacturing and appreciate benefits that can be derived by adopting newer manufacturing strategies.
4	Student will be able to implement the agile practices and technology in an industry.
5	Student will be able to measure the performance of a system.
6	Student will be able to create a learning factory for future challenges.

SUBJECT CODE: PEPE-127

SUBJECT NAME: TECHNOLOGY MANAGEMENT

CO#.	Course Outcomes COS
1	Demonstrate and apply the concept Technology Management in an organization.
2	Develop in-depth knowledge of Technology Forecasting, Development, Acquisition and Transfer. Technology Absorption and Diffusion and Assessment.
3	Develop in-depth knowledge of Technology Absorption and Diffusion and Assessment.
4	Explain the concept of laws regarding technology.
5	Develop in-depth knowledge of government Technology policies.
6	Explain the concept of technology developments

SUBJECT CODE: PEPE-128

SUBJECT NAME: MARKETING MANAGEMENT

CO#.	Course Outcomes COS
1	Demonstrate and apply the concept Marketing Management.
2	Develop in-depth knowledge of Marketing strategies formulation.
3	Develop in-depth knowledge of consumer and industrial markets.
4	Explain the concept of marketing mix decisions.
5	Develop in-depth knowledge of buyer behaviors.
6	Explain the concept of marketing research and trends.

SUBJECT CODE: PEPE-149

SUBJECT NAME: COMPOSITE MATERIALS

CO#.	Course Outcomes COS
1	Know the applications of composite materials.
2	Identify various constituents of composite materials and their characteristics.
3	Suggest and use standard methods for determining mechanical properties of different types of composite materials.
4	Use various techniques for processing of composite materials.
5	Asses the applicability and selection of a composite material for a specific application
6	Self-directed learning, incorporating researching properties of composite materials.

SUBJECT CODE: PEPE-150

SUBJECT NAME: MATERIAL TESTING & CHARACTERIZATION

CO#.	Course Outcomes COS
1	Interpret various materials characterization techniques.

2	Understand the principle and operation of characterization equipments and the adjustment of operation variables to obtain good images / results
3	select the characterization tool for specific application
4	compare the principle and operation of different characterization tools such as optical microscope, Scanning electron microscopes and transmission electron microscope
5	analyze the characterization results by various equipment
6	relate fundamental of physics to the basic operation of the equipment

SUBJECT CODE: PEPE-151

SUBJECT NAME: SCIENCE OF ENGINEERING & MATERIALS

CO#.	Course Outcomes COS
1	Apply knowledge of Mechanical Material Properties in designing specific products and experiments
2	Able to use Bio Material for the manufacturing of better human friendly product
3	Apply knowledge of ceramics properties in designing specific products and experiments
4	Able to make better utilization of electrical and electronics materials for designing new products
5	Able to use Nano Materials for the betterment of human race
6	Able to know about the safety and dangers of Nuclear Materials

SUBJECT CODE: PEPE-151

SUBJECT NAME: Deformation & Defects of Materials

CO#.	Course Outcomes COS
1	Will be able find plastic deformation in metals and alloys
2	Will be able find and remove point and line defects in materials
3	Will be able find and remove Planar defects in materials
4	Will be able find the causes of fatigue in materials
5	Will be able find and remove dislocation defects in materials
6	Will be able execute tests on materials to find the defects

SUBJECT CODE: PEPE,106

SUBJECT NAME: MAINTENANCE AND RELIABILITY ENGINEERING

CO#.	Course Outcomes COS
1	Demonstrate and apply the concept of Maintenance.
2	Develop in,depth knowledge of performance and cost.
3	Apply various maintenance measurement methods to enhance the performance.
4	Explain the concept of reliability.
5	Apply various reliability hazard rate and failure density function models.
6	Develop in, depth knowledge on various aspects of reliability calculations for maintained and stand, by systems

SUBJECT CODE: PEPE-107

SUBJECT NAME: STATISTICS AND NUMERICAL ANALYSIS

CO#.	Course Outcomes COS
1	Will be able to apply the knowledge of Sampling Theory in daily life problems
2	Will be able to apply the knowledge of ANOVA in solving statistical problems
3	Will be able to check the solutions by using Hypothesis method
4	Will be able to apply design of experiments in practical experimentations
5	Will be able to apply the knowledge of Regression Analysis to find the solutions of numerical problems
6	Will be able to apply the knowledge of Runga Kutta and Newton Rapson Method in solving numerical problems

SUBJECT CODE: PEPE-108

SUBJECT NAME: CRYOGENIC MANUFACTURING

CO#.	Course Outcomes COS
1	Explain cryogenic processes in details
2	Understand the processes of cryogenic liquid production and their storage
3	Describe the effect of cryogenic manufacturing on material properties.
4	Familiarize with various cryogenic refrigeration cycles.
5	Understand type of cryogenic insulation used during cryogenic manufacturing
6	Utilize cryogenic manufacturing for various applications.

Subject Code: PEPE-129

Subject Name: Plant Layout & Material Handling

CO#	Course Outcomes(CO)
1	Student will be able to understand the types of layouts.
2	Student will be able to understand the principles of site selections
3	Student will be able to understand the type of building types and structures
4	Student will be able to understand the concepts of different material handling processes
5	Student will be able to understand the able to safety aspects associated with layout and material handling

6	Student will be able to analyze the material handling parameters as per the layout requirements

Subject Code: PEPE-130

Subject Name: Productivity Management

CO#	Course Outcomes(CO)
1	Understand the dynamics of productivity measurement in manufacturing and service sectors.
2	Understand different productivity measurement models.
3	Understand the salient characteristics and limitations of different productivity measurement models.
4	Understand the differences among small, medium and large manufacturing enterprises as well as service sectors in the context of productivity measurement.
5	Will be able to evaluate the productivity of an organization
6	Will be able to implement green productivity to help the human race

Subject Code: PEPE-131

Subject Name: Project Management

CO#	Course Outcomes(CO)
1	Understand the dynamics of project management in manufacturing and service sectors.
2	Will be able to identify and select the best project
3	Understand the salient characteristics of Organizational Issues
4	Will be able to evaluate the project networks and project durations.
5	Will be able to evaluate risk analysis of an organization and projects
6	Will be able to evaluate project quality and purchase mechanisms

SUBJECT CODE: PEPE-132

SUBJECT NAME: ESTIMATING AND COSTING

CO#.	Course Outcomes COS
1	Student will be able to estimates the projects
2	Students will be able to calculate the Inventory cost of an organization
3	Students will be able to calculate the Material and Labor cost of an organization
4	Students will be able to calculate the Break Even Point of an organization and depreciation value of products of organization
5	Student will be able to evaluate the cost of workshop operations and process
6	Student will be able to evaluate design and develop budgets and contracts for an organization

SUBJECT CODE: PEPE-153

SUBJECT NAME: ADVANCE ENGINEERING MATERIALS

CO#.	Course Outcomes COS
1	Apply knowledge of Mechanical Material Properties in designing specific products and experiments
2	Able to use Bio Material for the manufacturing of better human friendly product
3	Apply knowledge of ceramics properties in designing specific products and experiments
4	Able to make better utilization of electrical and electronics materials for designing new products
5	Able to use Nano Materials for the betterment of human race
6	Able to know about the safety and dangers of Nuclear Materials

SUBJECT CODE: PEPE,154

SUBJECT NAME: ADVANCE CERAMICS

CO#	Course Outcomes COS
1	**Knowledge of the crystal structures of a wide range of ceramic materials.**
2	**Introductory knowledge on the processing of bulk ceramics**
3	**Understand the properties of ceramics and their structural origin.**
4	**Given a ceramic component be able to calculate its intrinsic and extrinsic defect populations.**
5	**Knowledge of the structure of clays, minerals, and glasses**
6	**Applications of ceramic materials in structural, biological and electrical components.**

SUBJECT CODE: PEPE-155

SUBJECT NAME: MATERIAL PROCESSING

CO#	Course Outcomes COS
1	Able to understand and apply the concept of solidification in real life problems
2	Able to understand and apply the concept of evaporation in real life problems
3	Able to process the powder metallurgy in industrial organizations
4	Able to synthesis the alloys for the betterment of human race
5	Able to utilize the thin film deposition method of processing of materials
6	Able to synthesis the biological materials or alloys for the betterment of human race

SUBJECT CODE: PEPE-156

SUBJECT NAME: AERO SPACE MATERIALS

CO#.	Course Outcomes COS
1	Identify appropriate aircraft materials for a given application
2	Understand the Heat Treatment processes of aircraft metals and alloys
3	Apply the knowledge about the mechanical behavior of different aircraft & aerospace materials.
4	Explain the applications of Aluminum alloys, Ceramics and Composites Materials.
5	Explain the properties of super alloys, ablative materials and high energy material.
6	Understand material corrosion process and apply prevention technique.