

### 3.1.1. Course Outcomes (COs) [2015-2019]

1-Year [2015-2016]

#### Course : ENGG WORKSHOP/IT WORKSHOP - [ A10082 ]

course outcome	Course outcome Statements
A10082.1	Understand graphics as the basic communication and methodology of the design process
A10082.2	understand the standards and common cases as well as dimensioning methods and tolerance in technical drawings development
A10082.3	Understand the geometries of the development of design projects.
A10082.4	Understand the displaying techniques for graphical communication in design process.
A10082.5	Able to develop multi-aspect sketches, additional and sectional views.

#### Course : ENGG LANGUAGE COMMUNICATION SKILLS LAB - [ A10083 ]

course outcome	Course Outcome Statements
A10083.1	Interpret the nuances of English through audio visual experiences
A10083.2	Apply the neutralized accent for intelligibility
A10083.3	Demonstrate speaking skills with confidence
A10083.4	Apply the language in public speaking

#### Course : COMPUTER PROGRAMMING LAB - [ A10581 ]

course outcome	Course Outcome Statements
A10581.1	To write programs in c to solve the problems.
A10581.2	To implement linear data structures such as lists, stacks, queues.
A10581.3	To implement simple searching and sorting methods.

#### Course : ENGINEERING CHEMISTRY lab/ENGINEERING PHYSICS LAB - [ A10081 ]

course outcome	Course Outcome Statements
A10081.1	Analyzing drinking water by measuring the amount of hardness and chloride content.
A10081.2	Determine the physical constants such as viscosity, surface tension, adsorption and acid value.
A10081.3	Apply the knowledge to synthesis of drug molecules and calculation of rf value of sample by tlc analysis.
A10081.4	Apply the appropriate instrumental method to determine the strength of acid.

#### Course : COMPUTER PROGRAMMING - [ A10501 ]

course outcome	Course Outcome Statements
A10501.1	Write algorithm & flow chart for the given problem.
A10501.2	Ability to write structured programs using control structures and functions.
A10501.3	Apply searching and sorting algorithms for the given list of elements
A10501.4	To be able to perform input/output, status and positioning functions of files.
A10501.5	Develop an application using c program
A10501.6	To develop advanced application using enumerated data types and structure.
A10501.7	To learn the basic of file handling mechanism.

**Course : ENGINEERING CHEMISTRY - [ A10005 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A10005.1	Examine water quality and select appropriate purification technique for intended problem
A10005.2	Discuss potential applications of various electrodes, batteries and fuels
A10005.3	Illustrate engineering applications of polymeric materials
A10005.4	Explain the significance of engineering material like cement,refractories and composites

**Course : ENGINEERING GRAPHICS - [ A10301 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A10301.1	Explain the principles of engineering graphics , use of different types of instruments.
A10301.2	Construct engineering curves , demonstrate classification of scales.
A10301.3	Draw the projections of points, lines, planes, solids.
A10301.4	identify sectional planes, sectional views , true shape of the sections.
A10301.5	understand the conversion of orthographic projections ,isometric projections.

**Course : ENGINEERING MECHANICS - [ A10302 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A10302.1	Understand and analyse force systems in a plane and in space.
A10302.2	Apply knowledge of frictional forces and their effect in design of machine elements.
A10302.3	Analyse concepts of centroid, centre of gravity, area moment of inertia and mass moment of inertia and their role in design of structures and machines.
A10302.4	Evaluate the concept of kinetics in motion of bodies.

**Course : ENGLISH - [A10001]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A10001 .1	It improves for successful business interactions.
A10001 .2	Develop language knowledge and professional communication skills
A10001 .3	Develops the ability to build relationships and accomplish tasks
A10001 .4	It improves the language profession of english in students with emphasis on grammar, reading and writing skills

**Course : ENGINEERING PHYSICS - [ A10004 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A10004 .1	Identify the structure and defects in solids using designed working models
A10004 .2	Apply the knowledge of x-ray diffraction techniques to study the structures of crystalline materials based on brags law of x-ray diffraction
A10004 .3	Explain the behavior of microstate matter particle quantum mechanically
A10004 .4	Describe the properties and application of dielectric and magnetic materials
A10004 .5	Determine the charge carrier distribution in an intrinsic and extrinsic semiconductor.
A10004 .6	Explain the construction and working of ruby, he-ne, semiconductor lasers, and optical fibers
A10004 .7	Explain the synthesis, characterization, and applications of nanomaterials in the range of 1-100 nanometers

**Course : MATHEMATICS 1 - [ A10002 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A10002 .1	Analyze the solution of linear system of equations
A10002 .2	Determine the Eigen values and Eigen vectors of a matrix also reduce the quadratic form to canonical form by orthogonal transformation
A10002 .3	Solve the applications on the mean value theorems
A10002 .4	Find the maxima and minima values of functions of two variables with/without constraints
A10002 .5	Evaluate multiple integrals and also the improper integrals using beta and gamma functions
A10002 .6	Apply the concept of differential equations to various engineering problems
A10002 .7	Solve the ordinary differential equations by using laplace transformations

**3 - Semester [2016-2017]****Course : METALLURGY AND MATERIAL SCIENCE LAB - [ A30085 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A30085.1	Ability to understand the properties to microstructure.
A30085.2	Ability to choose metals and alloys for industrial applications
A30085.3	Improving material properties by different heat treatment processes
A30085.4	Understand mechanical properties of materials for real time applications

**Course : MECHANICS OF SOLIDS - [ A30104 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A30104.1	Ability to apply the principles of elasticity, plasticity, stresses, strains and their relationships under various types of loads and to analyze the composite bars
A30104.2	Draw shear force and bending moment diagrams for various loads( point, UDL, UVL, and couple.)
A30104.3	determine flexural and shear stresses developed in various sections of beams
A30104.4	Design of beams and shafts according to theories of failure
A30104.5	To find principle stresses and strains and to apply theories of failure in the design of various mechanical parts
A30104.6	Calculate the stresses and strains associated with thin-wall spherical and cylindrical pressure vessels.
A30104.7	To determine stresses developed in a shaft and design of a shaft

**Course : ELECTRICAL AND ELECTRONICAL ENGINEERING - [ A30203 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A30203.1.	Understand predict the behavior of any electrical and magnetic circuits
A30203.2	Identify the type of electrical machine used for that particular application
A30203.3	Realize the requirement of transformers in transmission and distribution of electric power and other applications.
A30203.4	Analyzing the different types of instruments to measure electrical quantities.

**Course : THERMODYNAMICS - [ A30306 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A30306.1	Explain basic knowledge of types of system and energy transfer, work done and heat equation in different processes, power cycles and thermodynamic laws
A30306.2	Explain and to identify & apply fundamentals to solve problems like system properties, amount of work transfer and heat during various processes, steam properties at different temperatures and pressures using steam tables
A30306.3	Explain perfect gas laws, non-flow process, throttling process, compressibility charts
A30306.4	An ability to understand apply psychometric properties, mixture of perfect gas and read psychometric chart
A30306.5	Explain and comparison of different thermodynamic cycles for power and refrigeration cycle

**Course : METALLURGY AND MATERIAL SCIENCE - [ A31803 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A31803.1	An ability to apply knowledge of mathematics, science and engineering (to solve problems related to materials science and engineering)
A31803.2	Understand the relationship between crystal structure and microstructure of materials and mechanical properties
A31803.3	Identify, analyze and interpret the phases and microstructure of common ferrous and non-ferrous materials.
A31803.4	An ability to communicate effectively (oral presentation)
A31803.5	Understand and identify suitable heat treatment process for common engineering applications for ferrous and non-ferrous materials.
A31803.6	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
A31803.7	Understand structure, properties and processing methods for ceramic materials and composite materials.

**Course : ELECTRICAL AND ELECTRONICS ENGINEERING LAB - [ A30281 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A30281 .1	Analyze a given network by applying network theorems
A30281 .2	Analyze the performance characteristics of dc and ac electrical machines
A30281 .3	Analyze the performance characteristics of electronics circuits

**Course : PROBABILITY AND STATISTICS - [ A30008 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A30008.1	Understand random variables ,its types and distribution, density function for one random variable and its application using research paper
A30008.2	Calculate mean, variance, moment generating function, for distribution and density functions for single random variables application using research paper
A30008.3	Understand distribution, density function for multiple random variable
A30008.4	Calculate correlation coefficient and Regression lines for bivariate data
A30008.5	Understand the concept of theory of Estimation and testing of Hypothesis.
A30008.6	Apply Large and Small sample tests to make decisions from few samples which are taken out

	of population
A30008.7	Compute expected Queue length, ideal time, traffic intensity and waiting time of Infinity and finite Queue length problems
A30008.8	understand about random process, Markova process, Markova chains, classification of states and chains

#### 4 – Semester [2016-2017]

##### Course : Mechanics of Fluids and Hydraulic Machine Lab - [ A40188 ]

Course Outcome	Course Outcome Statements
A40188.1	Observe direct application of theory to practice and experiment on different types of turbine models, to analyze their performance characteristics at rated and off-design conditions.
A40188.2	Investigate through experimentation different types of pump models and estimate their performance during rated and off-design operational conditions
A40188.3	Apply principles of operation of different flow measuring instruments such as orifice meters, venture meters etc. and their adoptability in industry
A40188.4	Experiment and evaluate the performance of both rotary and reciprocating positive displacement pumps.

##### Course : MATHEMATICS-II - [ A40006 ]

Course Outcome	Course Outcome Statements
A40006.1	Solve Ordinary Differential Equations by Laplace Transforms
A40006.2	Evaluate integrals by Beta and Gamma functions.
A40006.3	Evaluate double integrals by change of variables and changing order of integration.
A40006.4	Compute area and volume of a body by Multiple integrals.
A40006.5	Explain vector differential operators and geometrical interpretation of Gradient, Divergence and Curl
A40006.6	Apply line integrals in Engineering Physics.
A40006.7	Evaluate triple integrals by change of variables and changing order of integration.

##### Course : MECHANICS OF FLUIDS AND HYDRAULIC MACHINES - [ A40112 ]

Course Outcome	Course Outcome Statements
A40112.1	Explain the effect of fluid properties on a flow system
A40112.2	Identify type of fluid flow patterns and describe continuity, eulers and bernoullis equations.
A40112.3	Analyze a variety of practical fluid flow and measuring devices and utilize fluid mechanics principles in design
A40112.4	Select and analyze an appropriate turbine with reference to given situation in power plants
A40112.5	Estimate performance parameters of a given centrifugal and reciprocating pumps
A40112.6	Demonstrate boundary layer concepts

##### Course : KINEMATICS OF MACHINARY - [ A40309 ]

Course Outcome	Course Outcome Statements
A40309.1	To analyze kinematic chains and mechanisms
A40309.2	Analysis of straight line motion mechanisms- velocity and acceleration diagrams.

A40309.3	Analysis of steering gears and Hooke's joints
A40309.4	Analysis of cams
A40309.5	Analysis of Higher Pair Mechanisms and Gears
A40309.6	Analysis of Gear Trains and Selection of Automobile Gear Boxes

**Course : MACHINE DRAWING - [ A40310 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A40310.1	Understand the drawings of conventional representation and assemblies along with their utility for design and development of mechanical system.
A40310.2	Work effectively with engineering and science teams as well as with multidisciplinary designs.
A40310.3	Skillfully use modern engineering tools and techniques such as cad- cam software for mechanical engineering design, analysis and application
A40310.4	Understand the drawings of mechanical components

**Course : PRODUCTION TECHNOLOGY - [ A40312 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A40312.1	Apply the concepts of manufacturing science in the design and development of mechanical systems.
A40312.2	Describe the various welding process.
A40312.3	Identify, formulate and solve manufacturing problems using technology and understand its impact in a global and societal context.
A40312.4	Explain the concept of forging, rolling process and drawing.
A40312.5	Select suitable manufacturing process for typical components.

**Course : THERMAL ENGINEERING-I - [ A40313 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A40313.1	Understand the engine terminology and importance behind the two stroke and 4 stroke ic engines.
A40313.2	To analyze the working of the basic components in the IC engines, Compressors and Refrigeration systems.
A40313.3	Understand the chemical reactions, combustion process and also how to influence the performance of the IC engines & pollution control
A40313.4	Apply the thermodynamic principles in the design of an IC engines, compressors and refrigeration system & know how to improve performance. refrigeration systems and compressors which are involving in energy flows
A40313.5	Formulate and perform the procedures required for the maintenance and operation of IC engines, compressors and refrigeration systems. Dynamic systems as well as actual systems.
A40313.6	Compare different IC engines, compressors and refrigeration systems and develop a system which meets the requirements.

**Course : PRODUCTION TECHNOLOGY LAB - [ A40382 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A40382.1	Understanding the properties of mounding sands and pattern making.
A40382.2	Fabricate joints using gas welding and arc welding.

A40382.3	Evaluate the quality of welded joints.
A40382.4	Basic idea of press working tools and performs moulding studies on plastics.

**5 – Semester [2017-2018]**

**course : MACHINE TOOLS AND METROLOGY LAB - [ A50384 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50384.1	Apply the procedures to measure length, width, depth, bore diameters, internal and external tapers, tool angles, and surface roughness by using different instruments
A50384.2	Measure effective diameter of thread profile using different methods
A50384.3	Demonstrate knowledge of different machine tools used in machine shop
A50384.4	Produce stepped surface using shaper and keyway using milling machine

**Course : THERMAL ENGINEERING LAB - [ A50383 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50383.1	To evaluate performance of IC engines and compressors under the given operating conditions.
A50383.2	Apply laws of thermodynamics to evaluate the performance of refrigeration and air-conditioning cycles.
A50383.3	Understand the functionality of the major components of the ic engines and effects of operating conditions on their performance

**Course : MANAGERIAL ECONOMICS AND FINANCIAL ANALSYS - [ A50010 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50010.1	Students will be able to understand economics and business economic concepts
A50010.2	Students will be able to differentiate different business organizations and nurture the idea of start-ups
A50010.3	Students will be able to build up decision making skill under uncertain business climate
A50010.4	To interpret the basics of financial accounting and relevance of accounting principles
A50010.5	Students will be able to evaluate long term investment proposals
A50010.6	Apply accounting concepts and methods to interpret financial statements for evaluating the financial position and performance of organizations

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50316.1	Apply the fundamental of stress analysis, theories of failure and material science in design of machine members.
A50316.2	Make proper assumptions with respect to material, factor of safety, load conditions for various machine members.
A50316.3	Apply stress analysis for knuckle joint , cotter joint and keys
A50316.4	Design different types of elements used in machine members.

**Course : DYNAMICS OF MACHINARY - [ A50317 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50317.1	Analyze the effect of a gyroscope on ships, aero planes and automobiles
A50317.2	Explain the working of important machine elements like clutches, brakes, dynamometers, flywheels, governors etc.

A50317.3	Analyze the theory involved in balancing of rotating and reciprocating members
A50317.4	Estimate the unbalanced forces in a multi-cylinder reciprocating engine
A50317.5	Understand longitudinal, transverse and torsional vibrations so as to avoid resonance

**Course : ENGINEERING METROLOGY - [ A50318 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50318.1	Graduates will demonstrate basic knowledge in mathematics, science and engineering
A50318.2	Graduates will demonstrate an understanding of their professional and ethical responsibilities
A50318.3	Graduates will demonstrate the ability to function on engineering and science laboratory teams, as well as on multidisciplinary design teams
A50318.4	Graduates will demonstrate the ability to identify, formulate and solve mechanical engineering problems
A50318.5	Graduates will have the confidence to apply engineering solutions in global and societal contexts. Graduates should be capable of self-education and clearly understand the value of life-long learning. Graduates will have ability to communicate in written, oral and graphical forms.

**Course : MACHINE TOOLS - [ A50321 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50321.1	Develop a strong foundation in machine tool engineering
A50321.2	Apply knowledge and hands-on competence in design and development of machine tool
A50321.3	Illustrate the working of lathe, drilling, boring, milling, shaper, slotting, planning machines
A50321.4	Summarize finishing processes and associated machines

**Course : THERMAL ENGINEERING-II - [ A50326 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A50326.1	Understand ideal steam power cycles.
A50326.2	Remember various components being used in steam and gas power plants.
A50326.3	Analyse the energy transfer and transfer motion in power cycle components with their performance evaluation.
A50326.4	Acquire knowledge on working of rocket and jet propulsion including their performance engines evaluation

**6 – Semester [2017-2018]**

**Course : ADVANCED COMMUNICATION SKILLS LAB - [ A60086 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A60086.1	Interpret the nuances of English through audio visual experience
A60086.2	Apply the neutralized accent for intelligibility
A60086.3	Demonstrate speaking skills with confidence
A60086.4	Apply the language in public speaking

**Course : DISASTER MANAGEMENT - [ A60117 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A60117.1	Describe the concept of environmental hazards, disasters and stress. Different approaches and relationship with human ecology.

A60117.2	Describe types of environmental hazards and disasters.
A60117.3	Explain various endogenous and exogenous hazards
A60117.4	Explain emerging approaches in disaster management

**Course : DESIGN OF MACHINE MEMBERS - II - [ A60329 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A60329.1	Apply the fundamental of theories of failure and material science in design of machine members
A60329.2	Understand the process of selection in suitable bearing based on the application of loads and predict the life of bearing.
A60329.3	Design ic engine parts
A60329.4	Design power transmission elements such as gears, belts, chains, pulleys, ropes and power screws.

**Course : FINITE ELEMENT METHODS - [ A60330 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A60330.1	Discuss the basic concepts and principles related to finite element methods.
A60330.2	Apply fem process for bars, truss, beams, axi-symmetric and iso parametric elements.
A60330.3	Calculate heat transfer for 1d and 2d elements using fem
A60330.4	Solve dynamic analysis problems of fem in bars, truss and beams.

**Course : HEAT TRANSFER - [ A60331 ]**

<b>Course Outcome</b>	<b>Course Outcome Statements</b>
A60331.1	Ability to analysis the modes of heat transfer.
A60331.2	Ability to derive relation for different modes of heat transfer.
A60331.3	Ability to perform thermal circuit analysis for practical engineering problems by using heat transfer concepts
A60331.4	Ability to analysis and design heat exchangers

**Course : REFRIGERATION AND AIR CONDITIONING - [ A60334 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A60334.1	Understand various refrigeration cycles and working of its system components.
A60334.2	Acquire knowledge on design aspects of refrigeration and air conditioning equipment's
A60334.3	Analyze psychometric, refrigeration, air-conditioning based human comfort and industrial requirement.
A60334.4	Create various heat pump circuits and justify the a/c process based on humidity.

**Course : AUTOMOBILE ENGINEERING - [ A62405 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A62405.1	Identify the different layouts and parts of the automobile.
A62405.2	Demonstrate the working of various systems in automotive engines.
A62405.3	Explain the importance and need of engine servicing.
A62405.4	Discuss emission standards and alternative fuels.

**Course : HEAT TRANSFER LAB - [ A60387 ]**

<b>course outcome</b>	<b>Course Outcome Statement</b>
A60387.1	Ability to analysis the modes of heat transfer.
A60387.2	Ability to derive relation for different modes of heat transfer.
A60387.3	Ability to perform thermal circuit analysis for practical engineering problems by using heat transfer concepts.
A60387.4	Ability to analysis and design heat exchangers.

**Course : COMPUTER AIDED DESIGN AND MANUFACTURING LAB - [ A70390]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70390.1	Modeling of simple machine parts and assemblies from the part drawings using standard cad packages.
A70390.2	Able to understand and handle design mechanical components in a systematic manner.
A70390.3	Able to understand and apply the principles of different types of analysis.
A70390.4	Generate cnc turning and milling codes for different operations using standard cam packages. write manual part programming using iso codes for turning and milling operations

**Course : ICS PDP LAB - [A70391 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70391.1	After undergoing the course the student can select appropriate device for the measurement of parameters like temperature, pressure, speed, stress, humidity, flow velocity.
A70391.2	Acquire the knowledge on the working principle, construction, calibration and its applications for various transducers.
A70391.3	Draw orthographic projections and section views of objects with dimensions using standard specifications and practices
A70391.4	Produce engineering drawings and models using AutoCAD and Autodesk inventor.

**Course : CAD/CAM - [ A70328 ]**

<b>course outcome</b>	<b>Course Outcome Statement</b>
A70328.1	Learn the fundamental knowledge of cad cam
A70328.2	Design the parts/ products using cad systems
A70328.3	Acquire knowledge on nc part programming
A70328.4	Prepare the part/product codes using group technology
A70328.5	Understand the layout of flexible manufacturing systems and apply the automated inspection methods.

**Course : INSTRUMENTATION AND CONTROL SYSTEMS - [ A70343 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70343.1	Understand the basic principles, characteristics, errors, limitations of measurement and its systems
A70343.2	Acquire the knowledge on the working principle, construction, calibration and its applications for various transducers.

A70343.3	Measure the values of displacement, temperature, pressure, level, flow, acceleration, speed, vibration, stress, strain and humidity
A70343.4	Recognize the application of fms, caqc, and cim.

**Course : Operations Research - [ A70352 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70352 .1	Understand different definitions, concepts and principles of or.
A70352 .2	Check the optimality of the solution for different or techniques by using different methods
A70352 .3	Solve lpp, transportation problem, assignment problem, sequencing problems, queuing theory, a theory of games, replacement problems and dynamic programming problem.
A70352 .4	Write an algorithm for transportation problem, assignment problem, sequencing problem, lpp and dpp.

**Course : Power Plant Engineering - [ A70353 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70353.1	Understand the sources of energy including steam, diesel, solar, wind, hydroelectric and nuclear power plant along their layouts and working principles
A70353.2	Acquire knowledge on combustion process in all power generation stations
A70353.3	Illustrate the working of components and its accessories of power plants.
A70353.4	Analyze the concepts of future power generation based on economics resources.

**Course : ROBOTICS - [ A70355 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70355.1	Understand robot terminology
A70355.2	To configure various robots with the help of given or required motions
A70355.3	Design the robot on with various links, mechanisms.
A70355.4	Find motion of end effectors from one position to another position by means of D-H matrix.
A70355.5	Calculate the requirement of actuators for moving the robotic arms from position to h.
A70355.6	Select robot for various applications in manufacture.

**Course : UNCONVENTIONAL MACHINING PROCESSES - [ A70359 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A70359.1	Understand the need and importance of non-traditional machining methods
A70359.2	Apply basic principle, equipment, process variables and mechanics of metal removal in abrasive jet machining and water jet machining
A70359.3	Knowledge of fundamentals of tool design, surface finishing and metal removal rate of electro chemical grinding, electro chemical machining and electro chemical honing.
A70359.4	Understand principles of operations, types of electrodes and process parameters and machine tool selection in edm and electric discharge grinding and wire cut process
A70359.5	Comprehend basics of electron beam machining and comparison of thermal and non-thermal processes
A70359.6	Understand metal removal mechanism, process parameters of plasma arc machining.

**8 – Semester [2018-2019]**

**Course : PRODUCTION PLANNING AND CONTROL - [ A80366 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A80366.1	Understand the objectives, functions, elements, types of production planning and
A80366.2	Analyze the importance of techniques, functions of forecasting and inventory management systems for proper utilization of 3-m.
A80366.3	Describe routing, scheduling and dispatching techniques.
A80366.4	Illustrate the application of computers in ppc.

**Course : PLANT LAYOUT AND MATERIAL HANDLING - [ A80365 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A80365.1	Identify the role that each department plays in achieving the goals of an organization
A80365.2	Explain the problems in organizing, planning and controlling the use of men, money, materials and machines for industrial production
A80365.3	Apply industrial engineering principles to solve the problems in organizing, planning and controlling the use of men, money, materials and machines for industrial production.

**Course : RENEWABLE ENERGY SOURCES - [ A80324 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A80324.1	Demonstrate various non-conventional sources of energy like wind, geothermal energy etc
A80324.2	Classify modern energy conversion technologies
A80324.3	Understand the working of various direct energy conversion systems and their applications.
A80324.4	Describe solar radiation and energy collection.

**Course : Industry Oriented Mini Project - [ A80087 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A80087.1	Understand engineering principles and develop an ability to apply them to software or core design of real time problems in an industry/ commercial environment.
A80087.2	Design and implementation core or software project using technical information from multiple sources
A80087.3	Demonstrate the ability to communicate effectively in speech and writing by following the professional ethics.
A80087.4	Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.
A80087.5	Understand the requirements, design, and implementation phases.
A80087.6	Prepare documentation with all the information about the project along with results.

**Course : Major Project Work - [ A80088 ]**

<b>course outcome</b>	<b>Course Outcome Statements</b>
A80088.1	Understand engineering principles and develop an ability to apply them to software or core design of real time problems in an industry/ commercial environment.
A80088.2	Design and implementation core or software project using technical information from

	multiple sources
A80088.3	Demonstrate the ability to communicate effectively in speech and writing by following the professional ethics.
A80088.4	Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.
A80088.5	Understand the requirements, design, and implementation phases.
A80088.6	Prepare documentation with all the information about the project along with results.

**Course : TECHNICAL SEMINAR - [ A80089 ]**

course outcome	Course Outcome Statements
A80089.1	Communicate and present effectively
A80089.2	Search the content available through different resources and could judge which is the correct information
A80089.3	Effectively listen and question the others appropriately to clarify the confusions if any.

**Course : Comprehensive Viva - [ A80090 ]**

course outcome	Course Outcome Statements
A80090.1	Test the knowledge acquired in the four year programme
A80090.2	To build a confidence about the learnt courses
A80090.3	Build confidence in attending interviews