DRONACHARYA
College of Engineering
Khentawas, Farrukh Nagar, Gurugram, Haryana
Approved by: All India Council for Technical Education (AICTE), New Delhi
Affiliated to: Gurugram University, Gurugram

DEPARTMENT OF ROBOTICS AND AUTOMATION ENGINEERING

ACADEMIC YEAR 2023-24

SEMESTER IV

Statistics and Numerical Methods

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Apply the concept of testing of hypothesis for small and large samples in real life problems.
(CO2)	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
(CO3)	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniquesof differentiation and integration for engineering problems.
(CO4)	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations
(CO5)	Solve the partial and ordinary differential equations with initial and boundary conditions by using certaintechniques with engineering applications.
(CO6)	Enhance critical thinking and decision-making abilities based on statistical analysis.

Machine Elements Design

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Apply the knowledge of Indian Standard codes and engineering fundamentals of material selection andmanufacturing considerations in design.
(CO2)	Identify the factors for engineering components design and analyse various members subjected to directstress
(CO3)	Design various members such as beams, levers, laminated springs for bending and stiffness.
(CO4)	Design various machine components under torsion such as shafts, shaft couplings, and keys. Design various threaded fasteners, power screws and curved machine components.

Control System Engineering

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Understand the concepts of control systems and importance of feedback in control systems.
(CO2)	Perform signal flow graph and formulate transfer function.
(CO3)	Perform computations and solve problems on frequency response analysis.
(CO4)	Analyse Polar , Bode and Nyquist's plot
(CO5)	Evaluate different types of state models and time functions.
(CO6)	Analyse different types of control systems like linear and non-linear control systems, etc.

Power Electronics and Drives

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Relate basic semiconductor physics to properties of power devices and combine circuit mathematics and characteristics of linear and non-linear devices.
(CO2)	Describe basic operation and compare performance of various power semiconductor devices, passive components and switching circuits
(CO3)	Design and Analyze power converter circuits and learn to select suitable power electronic devices by assessing the requirements of application fields.
(CO4)	Formulate and analyze a power electronic design at the system level and assess the performance. Students
(CO5)	Understanding feedback control, pulse width modulation (PWM) techniques, and implementing closed-loop control ofpower electronic converters.
(CO6)	Analyze and design motor control systems.

Kinematics ofMachine

Course Outcome (CO)	Details of Course Outcomes
(CO1)	To understand about the applications of mechanism and machines.
(CO2)	To understand about the basics Cams and Friction
(CO3)	Familiarize about power transmitted with Belts and pulleys and also Gears and Gear Trains.
(CO4)	Students having familiarization with calculate Kinematics Analysis of Plane Mechanisms
(CO5)	Students would be able to know the Kinematics synthesis of Mechanisms.
(CO6)	Perform kinematics synthesis of mechanisms

Computer Aided Design & Manufacturing

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Demonstrate the knowledge of Computer Aided design and Additive Manufacturing.
(CO2)	Understand the concept of wireframe modeling, surface modeling and solid modeling.
(CO3)	Understand the method of manufacturing of liquid based, powder based and solid based techniques
(CO4)	Apply the FEM to perform structural analysis and solve engineering problems
(CO5)	Analyze 1D and 2D structural problems
(CO6)	Evaluate the benefits and challenges of implementing FMS in manufacturing environments.

Power Electronics & Drives lab

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Understand the differences between signal level and power level devices.
(CO2)	Understand working of AC regulators.
(CO3)	Analyze controlled rectifier circuits
(CO4)	Analyze the operation of DC-DC choppers.
(CO5)	Analyze the operation of voltage source inverters.

Kinematics ofMachine LAB (P)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Understand the various practical demonstrations of mechanism.
(CO2)	Knowledge of Motions in mechanism with practical demonstration.
(CO3)	Learning the Special purpose machine members used in designing of a machine.
(CO4)	Synthesis of working model using the various linkages.

Computer Aided Design & Manufacturing _LAB

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Display of the basic fundamentals of modeling package.
(CO2)	Explore the surface and solid modeling features
(CO3)	Learning the techniques of 3D modeling of various mechanical parts.
(CO4)	To expedite the procedure and benefits of FEA and CAE.

Scientific & Technical writing Skills

Course Outcome (CO)	Details of Course Outcomes
Activities on Writing Skills	Structure and presentation of different types of writing - letter writing/ Resume writing/ ecorrespondence/ Technical report writing/ Portfolio writing - planning for writing - improving one's writing
Activities on Presentation Skills	Oral presentations (individual and group) through JAM sessions/seminars/PPTs andwritten presentations through posters/ projects/ reports/ e-mails/ assignments etc.
Activities on Group Discussion and Interview Skills	Dynamics of group discussion, intervention, summarizing,modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Conceptand process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference &video-conferencing and Mock Interviews.