Koneru Lakshmaiah Education Foundation
(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)
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Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA.
Phone No. +91 8645 - 350 200; www.klef.ac.in; www.klef.edu.in; www.kluniversity.in
Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph: +91 - 866 - 3500122, 2576129

Department of Mechanical Engineering

Program: M.Tech-Robotics and Mechatronics

Academic Year :2019-2020

S.NO.	CourseCode	CourseTitle	CO No.	Description of the Course Outcome
1	18ME5101	FUNDAMENTALS OF MECHATRONICS	CO1	Apply the principles of mechatronics and automation for the development of productive and efficient manufacturing systems.
			CO2	Be proficient in the use of Data conversiondevices and Microprocessors controllers and select suitable drives
			CO3	Be able to analyze mechanisms forindustrial applications and Design and analyze Hydraulic systems
			CO4	Analyze the Pneumatic systems and understand PID controllers, CNC machines and Industrial Robotics.
2	18ME5102	ADVANCED ENGINEERING MATHEMATICS	CO1	Perform elementary operations on matrices including determination of rank and inverse, demonstrate mastery in using matrix algebra.
			CO2	Interpret and apply differential calculus onproblems involving rate of change
			CO3	Illustrate the applications of integralcalculus in solving problems on area, volume, displacement, work.
			CO4	Determine gradient, divergence and curl ofvector point functions with their properties
3	18ME5103	SENSORS AND ACTUATORS	CO1	Identify appropriate sensor for a particularMechatronic system.
			CO2	Understand micro electro mechanicalsystem and its manufacturing methods
			CO3	Understand the hydraulic and pneumatic Actuation systems for selection ofappropriate actuation method for a particular Mechatronic system.
				Understand the electrical actuation

Dr. A. SRINATH
PROFESSOR & HEAD
Department of Mechanical Engineering
KL (Deemed to be University)
Vaddeswaram - 522 502

				systems for selection of appropriate
			CO4	actuation method for a particular
				Mechatronic system.
4	18ME5104	MODELINGAND SIMULATIO N OF MECHATRON IC SYSTEMS	CO1	Build mathematical models mechatronic systems comprising of combinations of mechanical, electrical, pneumatic/ hydraulic and thermal systems .
			CO2	Analyze systems for their time response to a certain input using transfer function and /or state space approach
			CO3	Apply system identification techniques tosynthesize system models
			CO4	Evaluate time and frequency response ofsystems and control system design
			CO5	Modeling and Simulation of MechatronicSystems using MATALAB/Simulink
5	18ME5205	ROBOTICS AND ADVANCED CONCEPTS	CO1	Perform Velocity and Static analysis ofManipulators
			CO2	Formulation of equation of motions bycomputer simulations
			CO3	Apply the Planning and control methodsfor robots
			CO4	Modeling and controlling of flexible manipulators
6	18ME5206	CONTROL OF MECHATRONICS SYSTEMS	CO1	Understanding the basic concepts of Modeling, Testing in terms of time domainand frequency domain
			CO2	Analyze the basic designing concepts of Modern and optimal controllers such asstate feedback and state observers.
			CO3	Analyze the basic designing concepts ofDigital controller for digital systems
			CO4	Analyze the basic designing concepts of Non-linear controllers for non-linear systems
7	18ME5207	MECHATRONICS PRODUCT DESIGN	CO1	Identify appropriate sensors, identifyappropriate actuation system for a given application.
			CO2	Identify appropriate microcontroller for a given application and to build a mathematical Model of system for evaluating open loop system performance and behavior.
			CO3	Suggest an appropriate closed loop controlstrategy to attain the desired system behavior.
			CO4	Suggest a Mechatronic product design for a given application and evaluate its performance.
			CO1	To understand concept of accuracy, errors& its causes.
			CO2	To know about geometrical dimensioningand tolerance

Dr. A. SRINA...
PROFESSOR & HEAD
Department of Mechanical Engineering
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Vaddeswaram - 522 502

8	18ME5208	PRECISION ENGINEERING	CO3	To understand concept of surface roughness and learn methods to improve surface finish.
			CO4	To understand precision engineering methods
9	18ME51A1	SIGNAL PROCESSING IN MECHATRONIC SYSTEMS	CO1	Analyze time signals, Discrete systems
			CO2	Analyze Frequency filters and phase systems
			CO3	Design FIR and IIR filter, bilinear transformation, and frequency transformations
			CO4	Apply DSP to speech, and Radar signal processing
10	18ME51A2	MEMS &NEMS	CO1	Introduction to MEMS and Microelectronic technologies used For MEMS
			CO2	Microsensors & MEMS applications inBiological, Chemical and Acoustic field.
			CO3	Introduction to MEMS basednanotechnology
			CO4	NEMS physics and NEMS architecture
11	18ME51A3	VEHICLE DYNAMICS AND MULTI-BODY SYSTEMS	CO1	Understand the concept of vehicle dynamics and analyze various parameters affecting it
			CO2	Analyze the effect of aerodynamics and braking systems on the performance of vehicle
			CO3	Analyze the steering systema ns suspension system effect on the performance of vehicle
			CO4	Apply various mathematical models to understand the dynamics of Multi-body systems
12	18ME51B1	EMERGING SMART MATERIALS FOR MECHATRONIC APPLICATIONS	CO1	Study of Smart materials and their application for sensing and actuation, Mechatronics aspects
			CO2	Understand the principle of Piezoelectricity and piezoelectric materials, Constitutive equations, actuator types and Controls for precise positioning and scanning.
			CO3	Understand the Basics of Ionic polymer metal composites (IPMC), Conductivity, Carbon nanotubes, Dielectric elastomers, Design & control issues and Applications of EAP (electro active polymers).
			CO4	Understand the magnetic properties of materials, magnetostriction: constitutive equations, types, design & control of magneto strictive actuators. Comparative analysis of different smart materials.
13	18ME51B2	INTELLIGENT VISUAL SURVEILLANCE	CO1	Apply basics of image processing to understand the video compression standards
			CO2	Apply the basics of image processing to analyze various object detection techniques
			CO3	Apply the Muti-object tracking method to understand human activity recognition
			CO4	Apply the concept of networking to collaborate with camera

Dr. A. SRINATH
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14	18ME51B3	MICROPROCESSORS AND EMBEDDED SYSTEMS	CO1	Understand the fundamentals of embeddedapplications
			CO2	Architectural understanding of processors through interfacing (8086)
			CO3	Programming model of microcontroller(8051 family)
			CO4	Interfacing and programming applicationsusing microcontrollers
15	18ME52C1	COMPUTATIONAL FLUID DYNAMICS	CO1	Understand the fundamentals of CFD and deriving governing equations
			CO2	Apply different CFD techniques to diffusion problems
			CO3	Solving convection-diffusion problems and N-S equations.
			CO4	Understand numerical grid generation and apply Lattice-Boltzmann methods to complex flows
16	18ME52C2	NONLINEAR OPTIMIZATION	CO1	Categorize convexity and non-convexityproblems
			CO2	Apply goal programming methods to solvemodals
			CO3	solve problems with positive coefficients using separable and geometric programming
			CO4	Implement search techniques to solveprogramming problems
18	18ME52D1	INDUSTRIAL AUTOMATION	CO1	Apply principles of automation towards material handling and analyze theirperformance.
			CO2	Analyze performance of storage systems and product flow in different GT methods and cellular manufacturing.
			CO3	Application and analysis of transfer line without internal storage and describe Inspection Technology
			CO4	Describe different manufacturing supporting systems.
19	18ME52D2	FUZZY SETS AND ARTIFICIAL INTELLIGENCE	CO1	Understanding various concepts Fuzzy Logic System
			CO2	Application of fuzzy Sets in Management, Medical and Engineering Fields.
			CO3	Introduction to AI, Understand the basic concepts of Artificial Intelligence using various search Techniques
			CO4	Neuro Fuzzy Approaches and Applications of AI in various Domains

Professor I/C Academics

HOD-ME
Dr. A. SRINATH
PROFESSOR & HEAD
Department of Mechanical Engineering
KL (Deemed to be University)
Vaddeswaram - 522502