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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

F.No:DrTTIT/IQAC/2020-21/075L
Semester: 3
Course1: Transform Calculus, Fourier series & Numerical Techniques **Course1code:**18MAT31
Course Outcomes: After studying this course, the students will be able to:

CO 1	Use laplace transforms and inverse Laplace transforms in solving differential /integral equations arising in network analysis and control systems and other fields of engineering.
CO 2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
CO 3	Make use of Fourier transform and Z-transform to illustrate discrete/ continuous function arising in wave and heat propagation, signals and systems
CO 4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multi step numerical methods.
CO 5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of regid bodies and vibrational analysis

Course Instructor: Srivakeha Prakash Signature

Course2: Electric Circuit Analysis **Course2 Code:** 18EE32
Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the basic concepts, basic laws and methods of analysis of DC and AC networks and reduce the complexity of network using source shifting, source transformation and network reduction using transformations
CO 2	Solve complex electric circuits using network theorems.
CO 3	Discuss resonance in series and parallel circuits and also the importance of initial conditions and their evaluation
CO 4	Synthesize typical waveforms using Laplace transformation.
CO 5	Solve unbalanced three phase systems and also evaluate the performance of two port

Course Instructor: S. SUBHASHINI Signature

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Course3: Transformers and Generators **Course3 Code:** 18EE33

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the construction and operation of 1-phase, 3-Phase transformers and
CO 2	Analyze the performance of transformers by polarity test, Sumpner's Test, phase
CO 3	Discuss the construction and working of AC and DC Generators & analyze the performance of the AC Generators on infinite bus and parallel operation.
CO 4	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods.

Course Instructor: S. SUBHASH INI Signature

Course4: Analog Electronic Circuits **Course4 Code:**18EE34

Course Outcomes: After studying this course, the students will be able to:

CO 1	Obtain the output characteristics of clipper and clamper circuits
CO 2	Design and compare baisaing circuits for transistor amplifier and explain the transistor switching.
CO 3	Explain the conpect of feedback, its types and design of feedback circuits
CO 4	Design and analyze the power amplifier circuits and oscillators for different frequencies.
CO 5	Design and analysis of FET and MOSFET amplifiers.

Course Instructor: Signature

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Course5: Digital System Design **Course5 Code:**18EE35

Course Outcomes: After studying this course, the students will be able to:

CO 1	Develop simplified switching equation using Karnaugh Maps and Quine McClusky techniques
CO 2	Design Multiplexer, Encoder, Decoder, Adder, Subtractors and Comparator as digital combinational control circuits
CO 3	Design flip flops, counters, shift registers as sequential control circuits
CO 4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits
CO 5	Explain the functioning of Read only and Read/Write Memories, Programmable ROM, EPROM and Flash memory

Course Instructor: Dr. N. Lakshmipathy Signature

Course6: Electrical and Electronic Measurements **Course6 Code:18EE36**

Course Outcomes: After studying this course, the students will be able to:

CO 1	To measure resistance inductance &capacitance using bridge &determine earth resistance
CO 2	Explain the working of various meters used for measurement of power,Energy & understand the adjustment calibration & Error in energy meter
CO 3	Understand methods of extending the range of instrument & instrument transform
CO 4	Explain working of different Electronic instruments
CO 5	Explain the working of different display & recording devices.

A. SRIDEVI
Course Instructor:

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Course7: Electrical Machines Laboratory -I **Course7 Code:**18EEL37

Course Outcomes: After studying this course, the students will be able to:

CO 1	Evaluate the performance of 1Φ and 3Φ transformer from the test data Obtained
CO 2	Compute the voltage regulation of synchronous Generator using test data
CO 3	Estimate the load shared by 2 1Φ Transformer for 3Φ operation and phase conversion

Course Instructor: S. SOBHASHINI Signature

Course8: Electronics Laboratory **Course8 Code:** 18EEL38

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design and test rectifier circuits with and without capacitor filters.
CO 2	Determine h-parameter models of transistor for all modes.
CO 3	Design and test BJT and FET amplifier and oscillator circuits.
CO 4	Realize Boolean expressions, adders and subtractors using gates

Course Instructor: Dhanalakshmi S Signature

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F.No:DrTTIT/IQAC/2020-21/075L

Semester:4

Course1: Complex analysis, probability & statistical methods **Course1 Code:**18MAT41

Course Outcomes: After studying this course, the students will be able to:

CO 1	Use the concept of analytic function and complex potential to solve the problems arising in electromagnetic field theory
CO 2	Utilize conformal transformation and complex integral arising in aerofoil theory
CO 3	Apply descrete and continuous probability distributions arising iin engineering fields
CO 4	Make use of correlation regression analysis to fit suitable mathematical module for the statistical data
CO 5	Constrtuct joint probability distribution and demostrate validity of testing the hypothesis

Course Instructor: Sriraksha Prakash . Signature

Course2: Power Generation and Economics **Course2 Code:**18EE42

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the working of Hydroelectric, Steam, Gas, Diesel, Nuclear power plants and state functions of major equipment of the power plants
CO 2	Classify various substations and explain the functions of major equipments in substations and also explain the types of grounding and its importance
CO 3	Infer the economic aspects of power system operation and its effects.
CO 4	Explain the importance of power factor improvement.

Course Instructor: S. SUBHASH INJ Signature

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Course3: Power Electronics **Course3 Code:** 18EE53

Course Outcomes: After studying this course, the students will be able to:

CO 1	To study applications of power electronics, different types of power semiconductor devices, their switching characteristics
CO 2	To study power diode characteristics, types, their operation and the effects of power diodes on RL circuits also to design and analyse of single phase diode
CO 3	To explain different power transistors, their steady state and switching characteristics and limitations
CO 4	To explain different types of thyristors, their gate characteristics and gate control requirements
CO 5	To explain the design, analysis techniques, performance parameters and characteristics of controlled rectifiers, DC-DC,DC-AC converters and Voltage

Course Instructor: Dr. N. Lakshmipathy Signature

Course4: Signals and Systems **Course4 Code:** 18EE54

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain basic operations on signals and properties of systems
CO 2	Discuss the use of convolution integral and convolution summation in analyzing the response of linear time invariant systems in continuous and discrete time
CO 3	Explain the properties of linear time invariant systems in terms of impulse response description
CO 4	Discuss fourier transform representation of continuous time and discrete time non periodic signals and the properties of Fourier Transforms.
CO 5	Understand the use of Z-transform in the complex exponential representation of discrete time signals and the analysis of systems.

Course Instructor: Jillian Rufus. J Signature

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Course5: Electrical Machine Design **Course5 Code:** 18EE55

Course Outcomes: After studying this course, the students will be able to:

CO 1	To discuss the design factors, limitations in design& modern trends in design &manufacturing of electrical machines.
CO 2	To Derive the output equation of D.C machine,1-Φ,3-Φ transformers, Induction motor & synchronous machines.
CO 3	Derive the output Equation of transformer, number cooling tubes, No-Load and LR reactance of transformer
CO 4	Derive the output Equation of three phase IM, and to explain design of rotor of squirrel cage and slip ring rotor.
CO 5	Discuss short circuit ratio & its effects in performance of synchronous machine. Design salient and non salient pole alternator.

A. SREEVI
Course Instructor:

Signature

Course6: High Voltage Engineering **Course6 Code:** 18EE56

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain conduction and breakdown in gasses,liquid dielectrics and solid dielectrics
CO 2	Differentiate various techniques used in generation of high voltage, currents with measurements techniques
CO 3	Analysis over voltage phenomenon and insulation codination in power sytems
CO 4	Applying various techniques for non destructive testing of materials and hv testing of electrics apparatus

Course Instructor: Dhanalakshmi V Signature

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Course7: Microcontroller Laboratory **Course7 Code:** 18EEL57

Course Outcomes: After studying this course, the students will be able to:

CO 1	Write assembly language programs for data transfer arithmetic, Boolean, and logical instructions.
CO 2	Write C language programs using keil version software to Generate different waveforms using DAC interface.
CO 3	Write C language programs using keil version software to Perform interfacing of stepper motor and dc motor

Course Instructor: B. somashekar Signature

Course8: Power Electronics Laboratory **Course8 Code:** 18EEL58

Course Outcomes: After studying this course, the students will be able to:

CO 1	To obtain Static characteristics of semiconductor devices to discuss their performance
CO 2	To Trigger the SCR by different methods
CO 3	To verify the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
CO 4	To control the speed of a DC motor, universal motor and stepper motor

Course Instructor: Jillian Rufus-J Signature

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Semester: 6
Course1: Control Systems **Course1 Code:** 18EE61

Course Outcomes: After studying this course, the students will be able to:

CO 1	Analyze and model electrical system using analogous
CO 2	Analyze and model mechanical system using analogous
CO 3	Formulate transfer function using block diagram and signal flow graphs.
CO 4	Analyze the stability of control system, ability to determine transient and steady state time response
CO 5	Illustrate the performance of the given system in time and frequency domains, Stability analysis using Root Locus

Course Instructor: Mrs. Daphny Shallet M Signature

Course2: Power System Analysis – 1 **Course2 Code:**18EE62

Course Outcomes: After studying this course, the students will be able to:

CO 1	Define per unit system, and explain advantages and computation and Show the concept of one line diagram and its implementation in problems
CO 2	Illustrate short circuit analysis on a synchronous machine and simple power system to select a circuit Breaker for the system
CO 3	Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits
CO 4	Analyze three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components
CO 5	Discuss the dynamics of synchronous machine, stability and types of stability

Course Instructor: B. Somashekar Signature

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Course3: Digital Signal Processing **Course3 Code:** 18EE63

Course Outcomes: After studying this course, the students will be able to:

CO 1	Compute DFT and IDFT of a given sequence using the basic definion
CO 2	Apply fast and efficient algorithms for computing DFT and inverse DFT of a given sequence
CO 3	Design and realize infinite impulse response Butterworth and Chebyshev digital filters using impulse invariant and bilinear transformation techniques
CO 4	Develop a digital IIR filter by direct, cascade, parallel, ladder and FIR filter by direct, cascade and linear phase methods of realization

Course Instructor: Jillian Rufus. J Signature

Course4: Computer Aided Electrical Drawing **Course4 Code:** 18EE643

Course Outcomes: After studying this course, the students will be able to:

CO 1	Develop armature winding diagram for DC and AC machines
CO 2	Develop a Single Line Diagram of Generating Stations and substation using the standard symbols
CO 3	Construct sectional views of core and shell types transformers using the design data
CO 4	Construct sectional views of assembled DC and AC machine and their parts using the design data or the

Ronald Lawrence. J

Course Instructor:

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Course3: Transmission and Distribution **Course3 Code:**18MAT43

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design overhead transmission system for a given voltage level and given required span.
CO 2	Assess the performance of transmission line of different line length and calculate transmission line parameters.
CO 3	Explain loss phenomenon is overhead transmission and types, grading and specification of underground cables.
CO 4	Discuss reliability and quality of distribution system and reliablity

Course Instructor: Dayananda P.R Signature

Course4: Electric Motors **Course4 Code:** 18EE44

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the constructional, operation and classification of DC motor, AC motor and special purpose motors
CO 2	Describe the performance characteristics & applications of Electric motors.
CO 3	Demonstrate and explain the methods of testing of DC machines and determine losses and
CO 4	Control the speed of DC motor and induction motor.
CO 5	Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of

Course Instructor: Dr. N. Laxminarthy Signature

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Course5: Electromagnetic Field Theory **Course5 Code:**18EE45

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the concept of gradient, divergence and curl of a vector. Use Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations
CO 2	Explain the energy and potential due to a system of charges.
CO 3	Explain the behavior of electric field across a boundary between a conductor and dielectric and Between two different dielectrics.
CO 4	Explain the behavior of magnetic fields and magnetic materials
CO 5	Assess time varying fields and propagation of waves in different media

Course Instructor: B. Somashekar Signature

Course6: Operational Amplifiers and Linear ICs **Course6 Code:**18EE46

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the basics of linear IC's
CO 2	Learn the designing of various circuits using linear IC's
CO 3	Use of linear IC's for specific applications
CO 4	Understand the concept and various types of converters
CO 5	Use of linear IC'sin hard ware projects

A. SREENI

Course Instructor:

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Course7: Electrical Machines Laboratory -2 **Course7 Code:** 18EEL47

Course Outcomes: After studying this course, the students will be able to:

CO 1	Test DC machines to determine their characteristics and also to control the speed of DC motor.
CO 2	Pre-determine the performance characteristics of DC machines by conducting suitable tests
CO 3	Perform load test on single phase and three phase induction motor to assess its performance
CO 4	Conduct test on induction motor to pre-determine the performance characteristics

Course Instructor: B.Somashekar Signature

Course8: Op- amp and Linear ICs Laboratory **Course8 Code:** 18EEL48

Course Outcomes: After studying this course, the students will be able to:

CO 1	To conduct experiment to determine the characteristic parameters of OP-AMP
CO 2	To design, test the OP-AMP as comparator,adder,subtracter,differentiator &integrator
CO 3	To design test the OP-amp as oscillator &filters
CO 4	Design & study of linear IC's as multivibrator power supplies

A. SRIDEVI
Course Instructor:

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F.No:DrTTIT/IQAC/2020-21/075L
Semester: 5
Course1: Management and Entrepreneurship **Course1 Code:**18EE51

Course Outcomes: After studying this course, the students will be able to:

CO 1	Analyse the field of management,task of the manager,planning and the need of proper staff, recruitment and selection process.
CO 2	Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business.
CO 3	Explain need of co-ordination between manager and staff in exercising the authority and delegating duties
CO 4	Understand the role and importance of small scale industries, business plan and its presentation.
CO 5	Discuss the concepts of project management, capital building process, project feasibility study, project appraisal and project financing

Course Instructor:Mr. Jillian Rufus J Signature

Course2: Microcontroller **Course2 Code:**18EE52

Course Outcomes: After studying this course, the students will be able to:

CO 1	Discuss the history of the 8051 & features of others 8051 family members and internal Arth. Of the 8051
CO 2	Discuss 8051 addressing modes, accessing data and I/O port programming, arithmetic, logic instructions, and programs. Develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and data serialization
CO 3	Develop 8051 c programs for time delay, I/O operations, I/O bit manipulation, logic and arithmetic operations, data conversion and timer programming
CO 4	Discuss the basic of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming
CO 5	Discuss and develop 8051 to work with external devices for ADC,DAC,stepper motor control, DC motor control, Elevator control

Course Instructor: R. Somasheloo Signature

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Course5:NCES **Course5 Code:** 18ME651

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe the environmental aspects of non conventional energy sources
CO 2	To know the concepts of solar radiation geometry,radiation flux on a tilted surface and solar thermalconversion
CO 3	Describe the need and analyses of liquid flat plate collectorsand Photovoltaic conversion
CO 4	Understand the concept of wind energy,tidal energy,OTEC with their components and applications
CO 5	Understand the concept of geothermal energy, biomass energy, hydrogen energy with their components and applications

Course Instructor: Balasubramaniam. N.S. Signature N.S.Bala

Course6: Control System Laboratory **Course6 Code:** 18EEL66

Course Outcomes: After studying this course, the students will be able to:

CO 1	To determine time & frequency domain responses of a given second order system
CO 2	To draw Ac & Dc characteristics of a servomotor & Synchro Transmitter Reciever
CO 3	To write script files to plot root locus

Course Instructor: Mrs. Daphny Shallet. M Signature

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Course7: Digital Signal Processing Laboratory **Course7 Code:** 18EEL67

Course Outcomes: After studying this course, the students will be able to:

CO 1	To explain the use of MATLAB software in evaluating the DFT and IDFT of a given sequence
CO 2	To verify the convolution property of the DFT
CO 3	To Design and implement IIR and FIR filters for given frequency specifications
CO 4	To realize IIR and FIR filters

Course Instructor: Jillian Rufus-I Signature

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Semester: 7

Course1: Power System Analysis – 2 **Course1 Code:**17EE71

Course Outcomes: After studying this course, the students will be able to:

CO 1	Formulate network matrices and models for solving load flow problems
CO 2	Perform steady state power flow analysis of power systems using numerical iterative techniques.
CO 3	Understanding of optimal operation of generators on a bus bar, optimal unit commitment.
CO 4	Discuss optimal scheduling for hydro thermal system and power system security.
CO 5	Analysis short circuit faults in power system networks using bus impedance matrix & to perform numerical solution of swing equation for multi machine stability

Course Instructor: B. Somashekar Signature

Course2: Power System Protection **Course2 Code:**17EE72

Course Outcomes: After studying this course, the students will be able to:

CO 1	Discuss performance of protective relays protection scheme & relay technology, overcurrent protection.
CO 2	Explain the working of distance relays& the effects of arc resistance .power swings & source impedance.
CO 3	Discuss pilot protection, wire pilot relaying & carrier pilot relaying.
CO 4	Discuss construction, operating principles & performance of differential relays
CO 5	Discuss protection of generators, transformers 7 busbar protection.

A. SRIDEVI
Course Instructor:

Signature

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Course3: High Voltage Engineering **Course3 Code:** 17EE73

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain conduction and breakdown in gases, liquid dielectrics and solid dielectricts.
CO 2	Differentiate various techniques used in generation of high voltage,current with measurement tecniques.
CO 3	Analyse overvoltage phenomenon and insulation co ordination in power systems.
CO 4	Applying various techniques for non distructive testing of materials and highvoltage testing of electric apparatus.

Course Instructor: Dhanalakshmi Signature

Course4: Power System Planning **Course4 Code:** 17EE744

Course Outcomes: After studying this course, the students will be able to:

CO 1	Discuss primary components of power system planning, planning methodology for optimum powersystem expansion, various types of generation, transmission and distribution.
CO 2	Analyse the forecasting of future load requirements of both demand and energy by deterministic and statistical techniques using forecasting tools.
CO 3	Discuss methods to mobilize resources to meet the investment requirement for the power sector
CO 4	Explain the expansion of power generation and planning for system energy in the country,evaluation of operating sates of transmission system.

Course Instructor: Raymond.B.L Signature

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Course5: FACTs and HVDC Transmission **Course5 Code:** 17EE751

Course Outcomes: After studying this course, the students will be able to:

CO 1	Discuss the basic concepts, transmission interconnections and flow of power in an AC system.
CO 2	Know the significance of shunt, series compensation and role of FACTS devices on system control.
CO 3	Identify significance of DC over AC transmission system, types and application of HVDC links
CO 4	Describe the basic components of a converter and the methods for compensating the reactive power demanded by the converter.

Course Instructor: Dayanand B.K Signature

Course6: Power system Simulation Laboratory **Course6 Code:**17EEL76

Course Outcomes: After studying this course, the students will be able to:

CO 1	Write Matlab program to find y bus
CO 2	Write Matlab program for Transmission line parameters
CO 3	Write programs using mi power for different fault analysis

Course Instructor: B. Comakkeal Signature

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Course7: Rely and High Voltage Laboratory **Course7 Code:**17EEL77

Course Outcomes: After studying this course, the students will be able to:

CO 1	Discuss performance of protective relaysprotection scheme & relay technology, overcurrent protection.
CO 2	Explain the working of distance relays& the effects of arc resistance.power swings & source impedance.
CO 3	Discuss pilot protection,wire pilot relaying & carrier pilot relaying.
CO 4	Discuss construction,operating principles & performance of differential relays
CO 5	Discuss protection of generators, transformers 7 busbar protection.

Course Instructor:

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Semester: 8

Course1: Power System Operation and Control **Course1 Code:** 17EE81

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe various levels of controls in power systems, the vulnerability of the system, components, architecture, configuration of SCADA and unit
CO 2	Explain issues of hydrothermal scheduling and solutions to hydro thermal problems
CO 3	Explain basic generator control loops, functions of Automatic generation control, speed governors
CO 4	Develop and analyse mathematical models of Automatic load frequency control
CO 5	Explain reliability, security, contigency analysis, state estimation and related issues of power systems.

Course Instructor: Jillian Reges-J Signature

Course2: Industrial Drives and Applications **Course2 Code:** 17EE82

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the Advantages and choice of Electric Drive Dynamic different modes of Electric drives
CO 2	To Suggest a motor for a drive and control of DC motor using controlled rectifiers
CO 3	Analysis the performance induction motor drives under different conditions
CO 4	Control induction motor, synchronous motor and stepper motor drives and its applications.

Course Instructor: Dhanalakshmi V Signature

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Course3: Operation and Maintenance of Solar Electric Systems **Course3 Code:** 17EE832

Course Outcomes: After studying this course, the students will be able to:

CO 1	Discuss basics of solar resource data, photovoltaic technology & usage
CO 2	Explain the use of photovoltaic system components
CO 3	Assess the site for photovoltaic system installation & grid connected system
CO 4	Explain installation,commissioning,operation & maintenance of photovoltaic systems

Course Instructor Signature

HOD

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