Course Title	Transforms, Fourier Series and Numerical Methods	Semester	III
Course Code	MVJ20MEE31	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	4 L : T : P :: 2 : 2 : 0	Total	100
Credits	3	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Solve the linear differential equations using Laplace transforms
- Apprehend and apply Fourier Series
- Realize and use of Fourier transforms and Z-Transforms
- Use of numerical methods to solve ordinary differential equation
- Use of statistical methods in curve fitting applications

Module-1	L1, L2, L3	8Hrs.

Laplace Transforms: Definition, Transforms of elementary functions, Properties, Periodic function, Unit step function.

Inverse Laplace Transforms: Inverse Laplace Transforms, Convolution theorem to find inverse Laplace transform.

Solution of linear differential equations using Laplace transforms

Applications: Analysis of electrical and electronic circuits, used in Signal processing and in control systems.

Video Link: https://youtu.be/NFuwtTT7VPM

Module-2	L1, L2, L3	8Hrs.

Fourier Series: Continuous and Discontinuous functions, Convergence and divergence of infinite series of positive terms, Periodic functions, Dirichlet's conditions, Fourier series of periodicfunctionsofperiod2πandarbitraryperiod.

Half Range Fourier Series: Half range Fourier sine series and cosine series of period and arbitrary period. Practical harmonic analysis

Applications: Fourier series solution to differential equation, Digital signal processing, spectrum analyzer.

Video Link: https://youtu.be/r18Gi8lSkfM

Module-3	L1, L2, L3	8Hrs.
Fourier Transforms: Infinite Fourier transform, Fourier Sine and Cosine transforms, Properties, Inverse Fourier transforms. **Z-Transforms:** Definition, standard Z-transforms, damping rule, shifting rule, initial value and final value theorems. Inverse Z- transform, Application of Z-transforms to solve difference equations. **Applications:** Fourier transforms used in image processing and Z-transforms in Digital signal processing. **Video Link:** https://youtu.be/spUNpyF58BY		
Module-4	**L1, L2, L3**	**8Hrs.**
Numerical solution of ordinary differential equations: Numerical solution of first order and first degree; Taylor's series method, modified Euler's method, Runge-Kutta method of fourth-order. Milne's and Adams- Bashforth predictor and corrector method. **Applications:** To solve initial value problems **Video Link:** https://youtu.be/pbYn3MEZyms		
Module-5	**L1, L2, L3**	**8Hrs.**
Statistical Methods: Correlation and regression-Karl Pearson's coefficient of correlation-problems. Regression analysis- lines of regression –problems. **Curve Fitting:** Curve fitting by the method of least squares, fitting of linear, quadratic and geometric curve. **Applications:** Applications of Correlation in Signal Processing and application of regression analysis in business **Video Link:** https://youtu.be/jwTvCxasICc		

Course outcomes:

C201.1	Learn to solve linear differential equations using Laplace transforms
C201.2	Learn to represent a periodic function in terms of sine and cosine functions.
C201.3	Evaluate Fourier transforms and use Z-transform to solve difference equations.
C201.4	Learn to solve algebraic, transcendental and ordinary differential equations numerically.

C201.5	Make use of the correlation and regression analysis to fit a suitable mathematical model forthe statistical data
Text Books:	
1	B.S. Grewal, "Higher Engineering Mathematics" Khanna Publishers, 44rd Editior 2013.
2	Prof G.B.Gururajachar "Engineering Mathematics-IV , Academic Excellent series Publications, 2017-18
Reference Books:	
1	Ramana B. V., "Higher Engineering Mathematics", Tata Mc Graw-Hill, 2006.
2	Bali N. P. & Manish Goyal, "A text book of Engineering Mathematics", Laxmi Publications, 8th Edition

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C201.1	3	3	-	3	-	-	-	-	-	-	1	-
C201.2	3	3	-	3	-	-	-	-	-	-	-	1
C201.3	2	3	-	3	-	-	-	-	-	-	1	-
C201.4	3	3	-	3	-	-	-	-	-	-	-	-
C201.5	3	3	-	2	-	-	-	-	-	-	-	1

High-3, Medium-2, Low-1

Course Title	Electric Circuit Analysis	Semester	III
Course Code	MVJ20EE32	CIE	50
Total No. of Contact Hours	50	SEE	50
No. of Contact Hours/week	5 L: T : P :: 3 : 1 : 1	Total	100
Credits	4	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Solve the DC&AC circuits using mesh and node analysis and reduction of network using various techniques.
- Apply various network theorems to solve circuits.
- Solve first and second order differential equations to obtain steady state and transient response in series & parallel RLC circuits.
- Analyze the unbalanced three phase circuits
- Analyze the series and parallel resonance in RLC circuits.
- Obtain the two port network parameters.

Module-1	L1, L2, L3	10Hrs.

Basic circuit concepts: Ideal and Practical sources, Source Transformations, Loop and nodal analysis with linearly dependent and independent sources for DC and AC circuits, Analysis of networks involving concepts of super node, Super mesh.

Laboratory Sessions/ Experimental learning: Verification of Kirchhoff's Voltage law and current law - Virtual lab experiment

Applications: Analysis of electric circuits by reducing the complexity.

Video link: https://nptel.ac.in/courses/108104139/

Module-2	L1, L2, L3	10Hrs.

Network topology: Graph of a network, Concept of tree and Co-tree, Incidence matrix, tie-set, tie-set schedule, cut-set & cut-set schedule, Formulation and solution of equilibrium equations, concept of duality and dual networks.

Resonant Circuits: Series and parallel resonance, frequency response of series and parallel circuits, Q factor, Bandwidth. Application.

Laboratory Sessions/ Experimental learning: Virtual lab experiment – Series/Parallel Resonance

Applications: Network topology- to understand the networking concepts

Resonant circuits- Oscillating circuit, Radio and communication engineering **Video link** :https://nptel.ac.in/courses/108102097/		
Module-3	**L1, L2, L3**	**10Hrs.**
Network Theorems: Superposition, Thevenin's and Norton's theorems; Maximum power transfer theorem, Reciprocity and Millman's theorem. **Laboratory Sessions/ Experimental learning**: Verification of all network theorems using Virtual lab. **Applications**: Analysis of complex electric circuits by reducing the complexity. **Video link**:http://www.digimat.in/nptel/courses/video/108105112/L20.html		
Module-4	**L1, L2, L3**	**10Hrs.**
Transient Analysis: Behaviour of circuit elements under switching condition and their representation, Evaluation of Initial and Final conditions in RL, RC and RLC circuits. **Laboratory Sessions/ Experimental learning**: Virtual Lab experiment on series/Parallel RL, RC circuits **Applications**: Stability Analysis of systems containing energy storage elements **Video link:** https://nptel.ac.in/courses/108102097/		
Module-5	**L1, L2, L3**	**10Hrs.**
Two port networks: Definition of Z, Y, ABCD parameters, Relationship between parameter sets. **Three-phase circuits**: Analysis of unbalanced star and delta connected loads, Neutral shift. **Laboratory Sessions/ Experimental learning**: Virtual lab experiment – Three phase power measurement for balanced/unbalanced star connected load **Applications**: Model of voltage, current characteristics of complex electrical networks, Modeling of transmission line. Video link: https://nptel.ac.in/courses/108102097/		
Course outcomes:		
C202.1	Analyse DC and AC circuits using mesh and node analysis.	
C202.2	Analyse series and parallel resonance circuits.	
C202.3	Apply network theorems to solve the circuits.	
C202.4	Apply analytical techniques to analyze transient behavior of networks.	
C202.5	Solve two port networks to obtain various parameters.	
Text Books:		

1	Hayt, Kemmerly and Durbin "Engineering Circuit Analysis" TMH 6th 2002
2	M E Van Valkenburg "Network Analysis" Ed 3. PHI. 2002

Reference Books:

1	J David Irwin et al" Engineering Circuit Analysis" Wiley India 10th Edition
2	D. Anand Kumar "Network analysis and Synthesis", PHI Learning, 2019.

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C202.1	3	3	1	1	3	-	-	-	-	-	-	2
C202.2	3	3	1	1	3	-	-	-	-	-	-	2
C202.3	3	3	1	1	3	-	-	-	-	-	-	2
C202.4	3	2	1	1	3	-	-	-	-	-	-	2
C202.5	3	2	1	1	3	-	-	-	-	-	-	2

High-3, Medium-2, Low-1

Course Title	Analog & Digital Electronics	Semester	III
Course Code	MVJ20EE33	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	4 L: T : P : : 2: 1 : 1	Total	100
Credits	3	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Understand the working of different diode and transistor circuits
- Use transistors as multistage amplifiers, feedback amplifiers and power amplifiers.
- Understand the working of oscillators and conversion of signals.
- Solve different logic equations using Kmap.
- Understand various flip flop applications and implement sequential logic circuits.

Module-1	L1,L2,L3	08Hrs.

Diode circuits: Diode clipping and clamping circuits, Special Diodes Schottky diodes, Tunnel diode, Varactor diode characteristics and applications.

Transistor analysis using h parameter model CE, CB, CC amplifiers comparison.

Laboratory Sessions/ Experimental learning: Static Transistor characteristics for CE, CB and CC modes and determination of h parameters.

Applications: Analysis of composite picture signals

Video link:

https://lake.videoken.com/nptel/category/698/search/clipping%20using%20diodes/video/tZE0-YcL0XM

Module-2	L1, L2, L3	08Hrs.

Multistage Amplifiers and Power Amplifiers: Direct coupled and RC Coupled multi-stage amplifiers, Darlington circuits analysis and design, Effect of Boot straping. Differential Amplifiers, Power amplifiers - Analysis of Class A, Class B & Class C amplifier.

Feedback Amplifiers: Concepts of feedback – Classification of feedback amplifiers – General characteristics of Negative feedback amplifiers – Effect of Feedback on Amplifier characteristics – Voltage series, Voltage shunt, Current series and Current shunt Feedback configurations – Simple problems

Laboratory Sessions/ Experimental learning: Determination of gain, input and output impedance of BJT Darlington emitter follower with and without bootstrapping.

Applications: Analysis and design of amplifier circuit for different applications

Video link:

https://lake.videoken.com/nptel/category/698/search/power%20Amplifiers/video/WFUDeyOEdt		
Module-3	**L1, L2, L3**	**08Hrs.**
Oscillators: Condition for Oscillations, RC type Oscillators-RC phase shift and Wien-bridge Oscillators, LC type Oscillators –LC Oscillators, Hartley and Colpitts **A/D and D/A Converters**: Binary weighted and R-2R ladder type DAC, DAC parameters; Flash type, counter ramp type, tracking, single slop and dual slope type ADC, Successive Approximation ADC. **Laboratory Sessions/ Experimental learning**: Analysis of Wien-bridge Oscillators and LC oscillator **Applications**: Analysis of different pulse generations. **Video link** : https://lake.videoken.com/nptel/category/698/search/a%2Fd%20and%		
Module-4	**L1,L2,L3**	**08Hrs.**
Principles of Combinational Logic: Definition of combinational logic, representation of logic functions-SOP and POS forms, Karnaugh maps-3,4,5 variables with don't care condition, Look ahead carry, Binary comparators **Digital Logic Families**: Comparison of RTL, DTL, TTL, ECL and MOS families -operation, characteristics of digital logic family. **Laboratory Sessions/ Experimental learning**: Analysis of Wien-bridge Oscillators and LC oscillator **Applications**: Generations of different pulses. **Video link**: https://www.youtube.com/watch?v=sUutDs7FFeA		
Module-5	**L1,L2,L3**	**08Hrs.**
Flip-Flops Applications: Triggering of Flip-flops: Master Slave Flip-Flops, Edge Triggered Flip Flops, Characteristic Equations, Conversion of flip-flops, Shift Registers, Ripple Counters, Synchronous Counters, Design of a synchronous mod-n counter using clocked T, JK, D and SRflip-flops. **Sequential Circuit Design**: Mealy and Moore models, State machine notation, Synchronous Sequential circuit analysis, Construction of state diagrams, counter design. **Laboratory Sessions/ Experimental learning**: Simplification, realization of Boolean expressions using logic gates/Universal gates. **Applications**: Analysis of switching device used in different relays. **Video link**: https://lake.videoken.com/nptel/category/698/search/Karnaugh%20maps/video/BzN3nFV-vTQ		

Course outcomes:

C203.1	Interpret the characteristics of different transistor configurations and special diodes.
C203.2	Develop multistage and feedback amplifiers and power amplifiers using transistors.
C203.3	Explain different oscillator circuits and signals conversion techniques.
C203.4	Solve different logic equations using K map and compare different logic families.
C203.5	Develop state diagrams for given clocked sequential circuits.

Text Books:	
1	Electronic Devices and Circuit Theory, Robert L Boylestad Louis Nashelsky, Pearson, 11th Edition, 2015.
2	M. Morris Mano, Digital Design, 4th Edition, Pearson Prentice Hall, 2008
Reference Books:	
1	Electronic Devices and Circuits, S.Salivahanan & N.Suresh, McGraw Hill, 3rd Edition, 2013
2	Charles H Roth and Larry L Kinney, Fundamentals of Logic design, Cengage Learning,2019.

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)
- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C203.1	3	3	2	-	-	-	-	-	-	-	-	-
C203.2	3	2	1	-	-	-	-	-	-	-	-	1
C203.3	3	2	1	-	-	-	-	-	-	-	-	2
C203.4	3	3	2	1	-	-	-	-	-	-	-	-
C203.5	3	3	2	2	-	-	-	-	-	-	-	-

Course Title	Power System Engineering	Semester	III
Course Code	MVJ20EE34	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	4 L: T : P :: 2 : 1 : 1	Total	100
Credits	3	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Understand the different types of power generating stations.
- Examine A.C. and D.C. distribution systems.
- Understand and compare overhead line insulators and Insulated cables.
- Illustrate the economic aspects of power generation and tariff methods.
- Evaluate the transmission line parameters calculations
- Understand the concept of corona

Module-1	L1, L2	8Hrs

GENERATION OF ELECTRIC POWER

Conventional Sources (Qualitative): Hydro station, Steam Power Plant, Nuclear Power Plant and Gas Turbine Plant.

Non-Conventional Sources (Qualitative): wind Energy and Solar Energy, Introduction of other Non-Conventional Sources (Ocean Energy, Tidal Energy, Wave Energy)

Laboratory Sessions/ Experimental learning: Visit near any power station to get practical knowledge on working of power station.

Applications: All industrial applications

Video link / Additional online information

http://nptel.iitm.ac.inhttps://youtu.be/Yg6XsepGCKY

Module-2	L1, L2, L3	8Hrs

ECONOMICS OF GENERATION

Introduction, definitions of connected load, maximum demand, demand factor, load factor, diversity factor, Load duration curve, number and size of generator units. Base load and peak load plants. Cost of electrical energy-fixed cost, running cost, Tariff on charge to customer.

Laboratory Sessions/ Experimental learning: Load estimating using software

Applications: Energy auditing

Video link / Additional online information: http://nptel.iitm.ac.inhttps://youtu.be/GRwJqD4StEU		
Module-3	L1, L2, L3	8Hrs
OVERHEAD LINE INSULATORS & INSULATED CABLES Introduction, types of insulators, Potential distribution over a string of suspension insulators, Methods of equalizing the potential. Introduction, insulation, insulating materials, Extra high voltage cables, insulation resistance of a cable, Capacitance of a single core and three core cables, Overhead lines versus underground cables, types of cables **Laboratory Sessions/ Experimental learning:** Insulation test of materials for high voltage-HVE Lab **Applications:** Design of insulators and cables **Video link / Additional online information:** http://nptel.iitm.ac.inhttps://youtu.be/gd1nruo4_iA		
Module-4	L1, L2, L3	8Hrs
INDUCTANCE & CAPACITANCE CALCULATIONS OF TRANSMISSION LINES Line conductors, inductance and capacitance of single phase and three phase lines with symmetrical. Composite conductors-transposition, bundled conductors, and effect of earth on capacitance. Corona: Introduction, disruptive critical voltage, corona loss, Factors affecting corona loss and methods of reducing corona loss, Disadvantages of corona. **Laboratory Sessions/ Experimental learning:** Calculation of inductance and capacitance of transmission line using MAT LAB -Simulink software. **Applications:** Design of transmission line for different voltages. **Video link / Additional online information:** http://nptel.iitm.ac.inhttps://youtu.be/lr1jgbR5ca8		
Module-5	L1, L2, L3	8Hrs
A.C. DISTRIBUTION Introduction, AC distribution, Single phase, 3-phase, 3 phase 4 wire system, bus bar arrangement, Selection of site for substation. Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving		

end voltage and with respect to respective load voltages. , Testing of HVDC Valves and Equipment.

DC DISTRIBUTION:

Classification of Distribution Systems. - Comparison of DC vs. AC and Under-Ground vs. Over- Head Distribution Systems. - Requirements and Design features of Distribution Systems.-.

Laboratory Sessions/ Experimental learning: Visit near AC power distribution substation to get practical knowledge on working of power substation

Applications: Domestic applications

Video link / Additional online information: http://nptel.iitm.ac.inhttps://youtu.be/_iz8ZkjD7z8

Course outcomes:	
C204.1	Discuss the operation of conventional generating stations and renewable sources of electrical power.
C204.2	Evaluate the economic aspects of power generation and tariff methods
C204.3	Discuss the performance of typical transmission and distribution system components.
C204.4	Determine the electrical circuit parameters of transmission lines
C204.5	Analyse A.C. and D.C. distribution systems for different loads.
Text Books:	
1	D P Kothari & I J Nagrath – Power System Engineering, Second Edition, MC Graw Hill Education, 2007.
2	V.K Mehta & Rohith Mehta- Principles of Power system, Revised Edition, S Chand.
Reference Books:	
1	C.L. Wadhwa –Electrical Power Systems, Fifth Edition, New Age International, 2009
2	M.V. Deshpande –Elements of Electrical Power Station Design, Third Edition, Wheeler Pub. 1998

CIE Assessment:

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

- Quizzes/mini tests (4 marks)

- Mini Project / Case Studies (8 Marks)
- Activities/Experimentations related to courses (8 Marks)

SEE Assessment:

i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C204.1	2	1	2	2	2	-	2	-	-	-	-	-
C204.2	2	1	2	3	2	-	-	-	-	-	-	-
C204.3	2	1	2	1	2	-	-	-	-	-	-	-
C204.4	3	2	2	2	2	-	-	-	-	-	-	-
C204.5	2	2	2	1	2	-	-	-	-	-	-	-

High-3, Medium-2, Low-1

Course Title	Electrical and Electronics Measurements	Semester	III
Course Code	MVJ20EE35	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	4 L: T : P :: 2 : 1 : 1	Total	100
Credits	3	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Understand the characteristics of measuring systems and operation of Analog meters.
- Understand the working of wattmeter, energy meter and Instrument transformers.
- Measure power factor, Frequency and basic circuit elements using Bridges.
- Understand the working of Function generator and display devices.
- Understand the principles of various types of transducers and sensors.

Module-1	L1, L2, L3	08Hrs.

Standards and Units: SI units of charge, voltage, current, power, energy, flux. Static characteristics: Accuracy, Precision, Sensitivity and Resolution and dynamic characteristics: speed of response and fidelity.

Analog and Digital Indicating Meters: - Types of analog instruments, Digital Instruments: AC digital voltmeter, DC digital voltmeter, multimeter : Measurement of current by digital multimeter, measurement of resistance by digital multimeter, complete circuit of digital multimeter.

Laboratory Sessions/ Experimental learning: Extension of the range of Voltmeter and Ammeter

Applications: Measurement of Voltage and Current in the Laboratories

Video link: https://nptel.ac.in/courses/108/105/108105153/

Module-2	L1, L2, L3	08Hrs.

Measurement of Power and Energy: Dynamometer type wattmeter Torque expression, digital wattmeter, Energy meter and its Calibration.

Instrument Transformers: Use of Instrument Transformers. Ratios and Burden of IT-Ratio and phase angle error of CT and PT, Silsbee's method of testing CT, Difference between CT and PT. **Laboratory Sessions/ Experimental learning**: Vlab- Three Power Measurement using two Wattmeter method **Applications**: Usage of Instrument Transformers for measurement of high current and Voltage and also used as the protective Relays for Power System **Video link**: https://nptel.ac.in/courses/108/105/108105153/		
Module-3	**L1,L2,L3**	**08Hrs.**
DC and AC Bridges: Necessity of Bridges, Resistance Measurement -Wheatstone bridge, Limitations, Kelvin double bridge, four-wire method. Measurement of L and C- Maxwell's Bridge, Schering Bridge. Measurement of Earth resistance – Megger. **Measurement of phase and frequency**: Power Factor meter, Synchro scopes, Q meter **Laboratory Sessions/ Experimental learning**: Vlab-Measurement of R,L C **Applications**: Measurement of unknown R,L C values and power factor **Video link** :https://nptel.ac.in/courses/108/105/108105153/		
Module-4	**L1, L2, L3**	**08Hrs.**
Function Generators: Introduction, Basic elements of Function generators, Pulse Generator **Display Devices**: Concept of Lissajous' patterns, Basic CRO Circuits, Introduction to DSO, Observation and Measurement of Voltage, Current, Frequency and Phase of a waveform, LCD and LED display **Laboratory Sessions/ Experimental learning**: Generation of different waveforms (eg:Sine, Square, Triangular etc) using simulation tool and measure the amplitude, frequency and other parameters **Applications**: Generate the test signals to analyze the performance of the system **Video link** https://nptel.ac.in/courses/108/105/108105153/		
Module-5	**L1, L2, L3**	**08Hrs.**
Transducers: Classification of transducers, selection factors, Operation of potentiometric transducer. LVDT, Thermistors, Thermocouples, Piezoelectric transducers. **Sensors**: Pressure Sensor, Temperature sensor, Hall effect sensor, photo sensor and its application		

Laboratory Sessions/ Experimental learning: Vlab- Characteristics of LVDT, Thermocouple, Temperature sensor, Strain gauge Sensor **Applications:** Used in various practical applications and in projects **Video link:** https://nptel.ac.in/courses/108/108/108108147/	
Course outcomes:	
C205.1	Distinguish the meters to measure the AC and DC electrical quantities
C205.2	Explain the working of Wattmeter, Energy meter and Instrument transformers.
C205.3	Identify and Select suitable Bridges to measure the basic electrical quantities.
C205.4	Explain the working of Function generator and interpret the waveform using CRO.
C205.5	Select the suitable transducer and sensor for a particular application.
Text Books:	
1	Sawhney A K, A Course in Electrical and Electronic Measurement and Instrumentation‖, Dhanpat Rai & Sons, New Delhi, 2011.
2	Doeblin E O and Dhanesh N Manik,Measurement Systems", McGraw-Hill, New Delhi, 2012.
Reference Books:	
1	David A. Bell,Electronic Instrumentation and Measurements, Oxford University Press, New Delhi, 2012.
2	Rangan C S, Sharma G R, Mani V S,Instrumentation Devices and Systems', Tata McGraw-Hill, New Delhi, 2004
CIE Assessment:	
CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests - Quizzes/mini tests (4 marks) - Mini Project / Case Studies (8 Marks) - Activities/Experimentations related to courses (8 Marks)	
SEE Assessment:	
i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.	

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C205.1	2	2	-	-	-	-	-	-	-	-	-	2
C205.2	2	2	-	-	-	-	-	-	-	-	-	2
C205.3	2	2	-	1	-	-	-	-	-	-	-	2
C205.4	-	2	-	-	2	-	-	-	-	-	-	3
C205.5	2	2	-	1	2	-	-	-	-	-	-	3

High-3, Medium-2, Low-1

Course Title	Object Oriented Programming& C++	Semester	III
Course Code	MVJ20EE36	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	4 L: T : P :: 2 : 1 : 1	Total	100
Credits	3	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Identify the need for Java - an object-oriented language. Set up Java JDK environment to create, debug and run simple Java programs.
- Illustrate the use of classes and distinguish the usage of different types of Inheritance and constructors in real world.
- Demonstrate the use of exceptions and to create multi-threaded programs
- Design the event driven Graphical User Interface (GUI) programming using swings
- Develop Java Application using JDBC connectivity.

Module-1	L1, L2, L3	08Hrs.

Prerequisites: Basic Knowledge about C or C++

Introduction to Object Oriented Concepts and Java: Java's Magic: the Byte code; Java Development Kit (JDK); The Java Buzz words, Object Oriented Programming - Two Paradigms, Abstraction, The Three OOP Principles, Simple Java programs. Data types, variables and arrays, Operators, Control Statements.

Laboratory Sessions/ Experimental learning:

A professor in college will allow a student to be excused from the final exam if either of the following is true:

- They have a 90% average or higher in the class and have missed 3 or less class lectures.
- They have a 80% average or higher in the class and have not missed any class lectures. The program below will determine whether a student can get out of the exam or not. Rewrite the program so only one if statement is used.

Applications: Arrays in mathematical vectors, matrices.

Video link / Additional online information:

Differences between JVM vs JRE vs JDK in Java:
https://www.youtube.com/watch?v=5Bp6GLU6HKE

Module-2	L1, L2, L3	08Hrs.

Classes, Inheritance, Packages and Interfaces: Classes fundamentals; Declaring objects; Assigning object reference variables; Introducing Methods, Constructors, this keyword, Finalize Method. Inheritance: Inheritance basics, using super, creating multi-level hierarchy, when constructors are called, method overriding, using abstract classes. Packages, Access Protection, Importing Packages, Interfaces.

Laboratory Sessions/ Experimental learning:

Write a program that calculates the number of buckets of paint to use for a room and the optimal number of cans to purchase. You need to ask the height of the room and the length and width of the room. The room is rectangular. You must paint the walls and the ceiling but not the floor. There are no windows or skylights. You can purchase the following size buckets of paint.

- 5-liter bucket costs $15 each and covers 1500 square feet.
- 1-liter bucket costs $4 and covers 300 square feet.

Applications: Inheritance in Banking Sectors

Video link / Additional online information:

Types of Inheritance: https://www.youtube.com/watch?v=ZP27c7i5zpg

Module-3	L1, L2, L3	08Hrs.

Exception Handling and Multi-Threaded Programming: Exception Handling fundamentals, Exception Types, Uncaught Exceptions, Using try catch, Multiple catch clauses, Nested try statements, throw, throws, finally, Java's built-in exceptions, Programming Examples.

Multi-Threaded Programming: The java thread model, Main thread, Creating Thread, creating multiple threads, Using is Alive () and join (), Thread priorities, Synchronization; Inter Thread Communication - Bounded buffer problem.

Laboratory Sessions/ Experimental learning:

The Producer-Consumer problem describes two processes, the producer and the consumer, which share a common, fixed-size buffer used as a queue.

- The producer's job is to generate data, put it into the buffer, and start again.

- At the same time, the consumer is consuming the data (i.e. removing it from the buffer), one piece at a time.

Make sure that the producer won't try to add data into the buffer if it's full and that the consumer won't try to remove data from an empty buffer. Write a java code to get the solution for this multi-process synchronization problem.

Applications: Multithreads in Browsers, Servers

Video link / Additional online information:

Multithreading: https://www.youtube.com/watch?v=O_Ojfq-OIpM

Module-4	L1, L2, L3	08Hrs.

Event Driven Programming: Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model.

Swings: The origins of Swing; Two key Swing features; Components and Containers; The Swing Packages; A simple Swing Application; Create a Swing Applet; Exploring Swing - Jlabel and Image Icon; JText Field; The Swing Buttons; JT abbed pane; JScroll Pane; JList; JComboBox; JTable

Laboratory Sessions/ Experimental learning:

Develop an Online Exam Project in Java Swing by using java array to store the questions, options and answers without using database.

Applications: Mobile Applications, Web Applications

Video link / Additional online information:

GUI – Simple Animation: https://www.youtube.com/watch?v=I3usNR8JrEE

Module-5	L1, L2, L3	08Hrs.

JDBC: The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; Result Set; Transaction Processing; Metadata, Data types; Exceptions.

Laboratory Sessions/ Experimental learning:

Develop Student Management System application with swings as the front end and database as the back end using JDBC connectivity.

Applications:

Scientific Applications, Financial Applications

Video link / Additional online information: Java JDBC: https://www.youtube.com/watch?v=hEWBIJxrLBQ	
Course outcomes:	
C206.1	Illustrate the Object-Oriented Programming concepts and basic characteristics of Java
C206.2	Demonstrate the principles of classes, inheritance, packages and interfaces
C206.3	Experiment with exception handling Mechanisms and Create multi-threaded programs
C206.4	Design event driven Graphical User Interface (GUI) programming application using swings
C206.5	Develop an application with Database using JDBC connectivity.
Text Books:	
1	Herbert Schildt, Java The Complete Reference, 7 /9th Edition, Tata McGraw Hill, 2007.
2	Mahesh Bhave and Sunil Patekar, "Programming with Java", First Edition, Pearson Education,2008, ISBN:9788131720806
Reference Books:	
1	Rajkumar Buyya , S Thamarasiselvi, xingchen chu, Object oriented Programming with java, Tata McGraw Hill education private limited.
2	E Balagurusamy, Programming with Java A primer, Tata McGraw Hill companies
CIE Assessment:	
CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests - Quizzes/mini tests (4 marks) - Mini Project / Case Studies (8 Marks) - Activities/Experimentations related to courses (8 Marks)	
SEE Assessment:	
i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.	

ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions.

iii. One question must be set from each unit. The duration of examination is 3 hours.

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C206.1	3	3	1	-	-	-	-	-	-	-	-	3
C206.2	3	3	1	-	-	-	-	-	-	-	-	3
C206.3	3	3	1	2	-	-	-	-	-	1	-	3
C206.4	3	3	3	3	-	-	-	2	2	2	-	3
C206.5	3	3	3	3	-	-	2	2	3	2	-	3

High-3, Medium-2, Low-1

Course Title	Circuits And Measurements Laboratory	Semester	III
Course Code	MVJ20EEL37	CIE	50
Total No. of Contact Hours	20	SEE	50
No. of Contact Hours/week	4 L : T : P :: 0 : 2 : 2	Total	100
Credits	2	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Verify network theorems using hardware setup as well as simulation tool
- Measure the resistance, inductance and ratio and phase angle error using suitable circuits/bridges.
- Understand the calibration of Single-Phase energy meter.
- Understand the working of transducers.

Sl No	Experiment Name	RBT Level	Hours
1	Verification of Thevenin's and Norton's Theorem	L3	2
2	Verification of Maximum Power Transfer Theorem	L3	2
3	Verification of Superposition Theorem	L3	2
4	Analysis of Series and Parallel Resonant Circuits	L3	2
5	Measurement of Low Resistance using four wire method	L3	2
6	Measurement of Medium Resistance using Wheatstone Bridge	L3	2
7	Measurement of Inductance using Maxwell's Bridge and Determine Q factor	L3	2
8	Measurement of Capacitance using Schering Bridge	L3	2
Along with mandatory experiments students are advised to complete two open ended experiments. The following are some suggestions for open ended experiments.			
1	Calibration of 1Φ Energy meter.	L3	2
2	Measurement of Linear displacement using LVDT.	L3	2
3	Measurement of temperature using Thermocouple	L3	2

Course outcomes:

C207.1	Apply simulation tool to analyze electrical circuits
C207.2	Verify the network theorem using simulation tool and hardware setup
C207.3	Select suitable bridge to measure the unknown values of Resistance, Inductance and Capacitance.

C207.4	Identify the % error in the energy meter by calibrating the energy meter.
C207.5	Make use of transducer in suitable application.

Scheme of Evaluation

SEE:

Examinations will be conducted for 100 marks and scaled-down to 50. The weight age shall be,

Write-up: 20 marks

Conduction: 40 marks

Analysis of results: 20 marks

Viva: 20

CIE:

Regular Lab work :20

Record writing :5

Lab Tests(Minimum 2 tests shall be conducted for 15 marks and average of two will be taken)

Viva 10 marks

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C207.1	3	2	-	2	-	-	-	-	3	-	-	3
C207.2	3	3	-	-	-	-	-	-	3	-	-	3
C207.3	3	2	-	-	1	-	-	-	3	-	-	1
C207.4	3	1	-	-	1	-	-	-	3	-	-	1
C207.5	3	1	-	-	1	-	-	-	3	-	-	2

High-3, Medium-2, Low-1

Course Title	Analog and Digital Electronics Laboratory	Semester	III
Course Code	MVJ20EEL38	CIE	50
Total No. of Contact Hours	20	SEE	50
No. of Contact Hours/week	4 L : T : P :: 0 : 2 : 2	Total	100
Credits	2	Exam. Duration	3 Hours

Course objective is to: This course will enable students to

- Design of different clipper and clamper circuits.
- Design and test different amplifier and oscillator circuits using BJT.
- Realize parallel adders and Subtractors circuits.
- Design and test counters and sequence generators.

Sl No	Experiment Name	RBT Level	Hours
1	Design of different clipping circuits	L3	2
2	Design of different clamping circuits	L3	2
3	Frequency response of single stage BJT and FET RC coupled amplifier and determination of half power points, bandwidth, input and output impedances.	L3	2
4	Realization of parallel adder/Subtractor using 7483 chip	L3	2
5	Design and implementation of code converters using logic gates (i) BCD to excess-3 code and vice versa (ii) Binary to gray and vice-versa	L3	2
6	Realization of 3 bit counters as a sequential circuit and MOD – N counter design using 7476,7490, 74192, 74193	L3	2
7	Design and realization of R-2R ladder DAC.	L3	2
8	Realization of Two bit Flash ADC	L3	2
Along with mandatory experiments students are advised to complete two open ended experiments. The following are some suggestions for open ended experiments.			
1	Design and Testing of Full wave – center tapped transformer type and Bridge type rectifier circuits with and without Capacitor filter. Determination of ripple factor, regulation and efficiency	L3	2
2	Design and testing of ring counter and Johnson counter	L3	2
3	Design and verify an IC 555 timer based pulse generator for the specified pulse.	L3	2

Course outcomes:

C208.1	Design of different clipper and clamper circuits.
C208.2	Design and test BJT and FET amplifier and oscillator circuits.
C208.3	Realize parallel adder/ Subtractors using 7483 chip
C208.4	Realize R-2R ladder DAC and two bit flash ADC.
C208.5	Design pulse generators for the specified pulse

Scheme of Evaluation

SEE:

Examinations will be conducted for 100 marks and scaled-down to 50. The weight age shall be,

Write-up: 20 marks

Conduction: 40 marks

Analysis of results: 20 marks

Viva: 20

CIE:

Regular Lab work :20

Record writing :5

Lab Tests(Minimum 2 tests shall be conducted for 15 marks and average of two will be taken)

Viva 10 marks

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C208.1	3	2	-	2	-	-	-	-	3	-	-	3
C208.2	3	3	-	-	-	-	-	-	3	-	-	3
C208.3	3	2	-	-	1	-	-	-	3	-	-	1
C208.4	3	1	-	-	1	-	-	-	3	-	-	1
C208.5	3	1	-	-	1	-	-	-	3	-	-	2

High-3, Medium-2, Low-1

Course Title	Balike Kannada	Semester	III
Course Code	MVJ20BK39/49	CIE	50
Total No. of Contact Hours	15	SEE	50
No. of Contact Hours/week	1 L:T:P :: 1:0:0	Total	100
Credits	1	Exam. Duration	2 Hours

Course objective is to: The course will enable, the students to understand Kannada and communicate in Kannada language.

- Vyavharika Kannada –Parichaya (Introduction to Vyavharikakannada)
- Kannada Aksharamaale haagu uchcharane(Kannada Alphabets and Pronounciation.
- Sambhashanegaagi Kannada Padagalu (Kannada Vocubulary for Communication).
- Kannada Grammer in Conversations(Sambhasaneyalli Kannada Vyakarana) Activities in Kannada

Module-1	L1, L2	1Hr

Vyavharika Kannada: Necessity of learning a local language, Tips to learn the language with easy methods, Hints for correct and polite conversation, About Kannada language (Kannada Bhase)

Video Links: https://youtu.be/fd966GC8Yko

Module-2	L1, L2	5Hrs.

Kannada Alphabets And Pronunciation: Kannada Aksharamaale(Vowels, consonants & Unstructured consonants),Kannada stress letters, Kannada Khagunitha, Pronunciation (Swaragala Uchcharane, Vyanjangala Ucharane), Exercises

Video Links: https://youtu.be/RuRmq7VyCaQ

Module-3	L1, L2	5Hrs.

Sambhasanegaagi Kannada Padagalu: Introduction, Ekaavachana Mattu Bhavuvachana, Linga (Gender),Prashnarthaka padagalu(Interrogative words),Viruddha Padagalu (Antonyms),Asamanjasa Ucharane (Inappropriate Pronunciations), Sankyavyavasthe (Numbers System) , List of Vegetables, Bhinnamshagalu (Fractions) ,Menu of famous food items in Karnataka , aaharaPadarthgala hesaragalu (Names of the Food Items),Samay /Kalakke Sambhandhisida padagalu (Words Relating to Time) ,Dikkugalige sambhasidhisida padagalu (words Related to Directions),Manushyana Bhavanegalige sambhadhisida Padagalu (Words Related to Humen's Feelings and Emotions),Manushyana

shareerada bhagagalu (Parts of the Human Body),Sambhandhisida sambhandhakke padagalu (Words Related to Relationship), Vasadstalakke sambhandhisida padagalu (Words Related to Place of Living), Saamanya Sambhasaneyallibhalasuvantha Padagala Patti (List of Words used in the general communication) & Colors in Kannada **Video Links:** https://youtu.be/PoQ9m16d7QA		
Module-4	**L1, L2**	**8Hrs.**
Kannada Grammer in Conversations (Sambhasaneyalli Kannada Vyakarna):Introduction , Nouns (Naampadagalu), Pronoun (Sarvanaampadagalu) , Use of Pronouns in Kannada Sentences , Adjectives (Kannada namaVishenegalu) , Kannada Verbs (Kriya Padagalu) , Adverbs in Kannada (Kriya Vishenegalu) , Conjuctions in Kannada (Sanyaga) , Preposition in Kannada (Poorvabhavi). **Video Links:** https://youtu.be/fd966GC8Yko		
Module-5	**L1, L2**	**1Hr**
Activies in Kannada (Kannadadalli Chatuvatikegalu): Activites –Vocubulry (Shabdakosh),Conversation (Shambhasane) **Video Links:** https://youtu.be/fd966GC8Yko		

Course outcomes:	
CO1	Understanding the advantage of learning a local language
CO2	Understanding the difference between pronunciation of English and Kannada
CO3	Understanding the word meaning in Kannada and frame the simple sentences if any difficulty can use any other language words to complete the conversation
CO4	Understanding the word meaning and frame the sentences and try to translate Kannada to English vise versa
CO5	Understanding the Kannada grammar and how to implement in Kannada sentences for communication
Text Books:	
1	Sankispta Kannada Nighantu (Parishkratha), Kannada sahitya Parishatha,Bangalore
2	Mysore vishwavidyalayada English –Kannada Nighantu (Parishkratha) samputa–(A inda Z varage)
Reference Books:	

1	Vyavharika Kannada PatyaPusthaka by L.Thimmesha
2	Kacheri Kaipidi –Dr .Ha .Ma. Nayak, Kannada Adhyanasamsthe . Mysorevishwavidyalayada ,1974
CIE Assessment:	
CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests - Quizzes/mini tests/Activities (20 Marks)	
SEE Assessment:	
Question paper of SEE consists of 50 Multiple choice questions. Students have to answer all 50 questions and each question carries 1 mark.	

High-3, Medium-2, Low-1

Course Title	SAMSKRUTHIKA KANNADA	Semester	III
Course Code	MVJ20SK39	CIE	50
Total No. of Contact Hours	20 L: T: P 1:0:0	SEE	50
No. of Contact Hours/week	1	Total	100
Credits	1	Exam. Duration	3Hrs

Course objective: This course will enable students to understand Kannada and communicate in Kannada language

- Samskruthika Kannada –Parichaya (Introduction to Adalithakannada)
- Kannada Kavyagalaparichaya(Kannada D Ra Bendre, Siddalingaiha)
- Adalithdalli Kannada Padagalu (Kannada KagunithaBalake, PatraLekhana, Prabhandha)
- Kannada Computer Gnyana(Kannada ShabdhaSangraha, Computer Paribashikapadagalu)
- Activities in Kannada.

Module-1	L1	4 Hrs
1. ಕನ್ನಡ ಭಾಷೆ-ಸಂಕ್ಷಿಪ್ತ ವಿವರಣೆ. ಶ್ರಾವಣ ಮತ್ತು ಬೆಲ್ಚಿಯ ಹಾಡು (ಕವನಗಳು), ಆಡಳಿತ ಭಾಷೆ ಕನ್ನಡ, ಆಡಳಿತ ಭಾಷೆಯ ಲಕ್ಷಣಗಳು, ಆಡಳಿತ ಭಾಷೆಯ ಪ್ರಯೋಜನಗಳು. 2. ಭಾಷಾ ಪ್ರಯೋಗದಲ್ಲಾಗುವ ಲೋಪದೋಷಗಳು ಮತ್ತು ಅವುಗಳ ನಿವಾರಣೆ ಕಾಗುಣಿತದ ತಪ್ಪು ಬಳಕೆ ಹಾಗೂ ಅವುಗಳ ನಿವಾರಣೆ, ಅಲ್ಪಪ್ರಾಣ ಮತ್ತು ಮಹಾಪ್ರಾಣ, ವಿಶೇಷಣ ಹಾಗೂ ವಿಶೇಷ್ಯ, ನಾಮಪದಗಳು, ಗೌರವ ಸೂಚಕಗಳ ಬಳಕೆ, ಅನಾವಶ್ಯಕ ಲಿಂಗ ಸೂಚಕ.		

Module-2	L1	4 Hrs
1. ೇಖನ ಚಿಹ್ನೆಗಳು ಮತ್ತು ಅವುಗಳ ಉಪಯೋಗ ಪೂರ್ಣ ವಿರಾಮ, ಅಲ್ಪವಿರಾಮ, ವಿವರಣ, ಅರ್ಧವಿರಾಮ, ಪ್ರಶ್ನಾರ್ಥಕ, ಭಾವಸೂಚಕ, ಉದ್ಧರಣ, ಅವಾರಣ ಚಿಹ್ನೆಗಳು 2. ಪತ್ರ ವ್ಯವಹಾರ. ಅರ್ಜಿ, ಖಾಸಗಿ ಪತ್ರ, ವ್ಯವಹಾರಿಕ ಪತ್ರದ ಉದಾಹರಣೆಗಳು.		

Module-3	L1	4 Hrs
1. ಆಡಳಿತ ಪತ್ರಗಳು. ಸಾಮನ್ಯ ಪತ್ರಗಳು, ಸರ್ಕಾರಿ ಪತ್ರಗಳು, ಅರೆ ಸರ್ಕಾರಿ ಪತ್ರಗಳು. 2. ಸರ್ಕಾರದ ಆದೇಶ ಪತ್ರಗಳು ಸರ್ಕಾರಿ ಆದೇಶದ ವಿವಧ ರೂಪಗಳು, ಸೂತ್ತೋಲೆ, ಕಛೇರಿ ಆದೇಶ ಪತ್ರ, ಅಧಿಸೂಚನೆ.		

Module-4	L1	4 Hrs
1. ಸಂಕ್ಷೇಪ್ತ ಪ್ರಬಂಧರಚನೆ, ಪ್ರಬಂಧ ಮತ್ತು ಭಾಷಾಂತರ ಪ್ರಬಂಧದ ವಿವಿಧ ಪ್ರಕಾರಗಳು, ಲಕ್ಷಣ ಮತ್ತು ಬರೆಯುವ ವಿಧಾನಗಳು, ಭಾಷಾಂತರದ ಪ್ರಯೋಜನಗಳು. 2. ಕನ್ನಡ ಶಬ್ದಸಂಗ್ರಹ ಜೋಡುನುಡಿ, ಅನುಕರಣವಾಚಿಗಳು, ಸಮಾನಾರ್ಥಕ ಪದಗಳು, ನಾನಾರ್ಥಗಳು, ವಿರುದ್ಧ ಪದಗಳು, ತತ್ಸಮ-ತದ್ಭವಗಳು, ನುಡಿಗಟ್ಟು, ದ್ವಿರುಕ್ತಿ		

Module-5	L1	4 Hrs
1. ಕಂಪ್ಯೂಟರ್ ಹಾಗೂ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಕನ್ನಡ ಕೀಲಿಮಣೆ, ಕನ್ನಡ ಟೈಪಿಂಗ್. **2.** ಪಾರಿಭಾಷಿಕ ಆಡಳಿತ ಕನ್ನಡ ಪದಗಳು ಮತ್ತು ತಾಂತ್ರಿಕ/ಕಂಪ್ಯೂಟರ್ ಪಾರಿಭಾಷಿಕ ಪದಗಳು. ಪದಕೋಶ ಕೈಪಿಡಿ: ಕನ್ನಡದಿಂದ ಇಂಗ್ಲಿಷ್‌ಗೆ, ಇಂಗ್ಲಿಷ್‌ನಿಂದ ಕನ್ನಡಕ್ಕೆ.		

ಆಕರ ಗ್ರಂಥ	
1.	ಆಡಳಿತ ಕನ್ನಡ (ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡದೊಂದಿಗೆ) ಡಾ. ಎಂ ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ ಕೇಶವಮೂರ್ತಿ
ಗ್ರಂಥ ಋಣ	
1.	ಕನ್ನಡ ನಿಘಂಟು (ಪರಿಷ್ಕೃತ), ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್, ಬೆಂಗಳೂರು.
2.	ಕಾನೂನು ಪದಕೋಶ (ಪರಿಷ್ಕೃತ) ಕನ್ನಡ-ಇಂಗ್ಲೀಷ್, ಕನ್ನಡ ಮತ್ತು ಸಂಸ್ಕೃತಿ ನಿರ್ದೇಶನಾಲಯ, ಬೆಂಗಳೂರು.
3.	ಸಂಕ್ಷೀಪ್ತ ಕನ್ನಡ ಭಾಷೆಯ ಚರಿತ್ರೆ, ಎಂ. ಎಚ್ ಕೃಷ್ಣಯ್ಯ -1993, ಸುವಿದ್ಯಾ ಪ್ರಕಾಶನ, ಬೆಂಗಳೂರು.
4.	ಆಡಳಿತ ಕನ್ನಡ, ಕನ್ನಡ ಅಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರ ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು-560001, ಮತ್ತು ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.
5.	ಕಂಪ್ಯೂಟರ್ ತಂತ್ರಜ್ಞಾನ ಪದವಿವರಣ ಕೋಶ, ಟಿ.ಜಿ. ಶ್ರೀನಿಧಿ ಕನ್ನಡ ಅಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರ ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು-560001
ಕಲಿಕೆಯ ಫಲಿತಾಂಶಗಳು	
1.	ಕನ್ನಡ ಕವಿಗಳ ಪರಿಚಯ, ಕನ್ನಡ ಭಾಷಾ ಶ್ರೀಮಂತಿಕೆ ಹಾಗೂ ಸಾಹಿತ್ಯದ ಒಲವು, ಕನ್ನಡ ಬರವಣಿಗೆಯಲ್ಲಿನ ಶುದ್ಧತೆ.
2.	ಲೇಖನ ಚಿಹ್ನೆಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವುಗಳ ಉಪಯೋಗ, ಪತ್ರ ವ್ಯವಹಾರದ ಅರಿವು.
3.	ಸರ್ಕಾರಿ ಪತ್ರಗಳು ಹಾಗೂ ಅವುಗಳ ಮಾಧರಿಗಳ ಪರಿಚಯ.
4.	ಶ್ರೇಷ್ಠ ವ್ಯಕ್ತಿಗಳ ಜೀವನ ಶೈಲಿಯ ಪರಿಚಯ ಹಾಗೂ ಸ್ಪೂರ್ತಿ, ಭಾಷಾಂತರದ ಮೌಲ್ಯದ ಅರಿವು.
5.	ತಂತ್ರಜ್ಞಾನದಲ್ಲಿ ಕನ್ನಡದ ಭಾಷ ಬಳಕೆ.

CIE Assessment:
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SEE Assessment:
i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus. ii. Part B also covers the entire syllabus consisting of five questions having choices and may contain sub-divisions, each carrying 16 marks. Students have to answer five full questions. iii. One question must be set from each unit. The duration of examination is 3 hours.

Course Title	UNIVERSAL HUMAN VALUES I	Semester	III
Course Code	MVJ20UHV310	CIE	50
Total No. of Contact Hours	15 L: T: P:1: 0 :0	SEE	50
No. of Contact Hours/week	1	Total	100
Credits	1	Exam. Duration	2 Hrs.

Course objective is to: This course will enable the students to

- Perceive the need for developing a holistic perspective of life
- Sensitise the scope of life – individual, family (inter-personal relationship), society and nature/existence, Strengthening self-reflection
- Develop more confidence and commitment to understand, learn and act accordingly

Module-1	L1, L2	3 Hrs

Welcome and Introductions: Getting to know each other (Self-exploration)

Aspirations and Concerns: Individual academic, career, Expectations of family, peers, society, nation, Fixing one's goals (Basic human aspirations Need for a holistic perspective Role of UHV)

Self-Management: Self-confidence, peer pressure, time management, anger, stress, Personality development, self-improvement (Harmony in the human Being)

Health: Health issues, healthy diet, healthy lifestyle, Hostel life (Harmony of the Self and Body Mental and physical health)

Relationships: Home sickness, gratitude, towards parents, teachers and, others Ragging and interaction, Competition and cooperation, Peer pressure (Harmony in relationship Feelings of trust, respect, gratitude, glory, love)

Society: Participation in society (Harmony in the society)

Natural Environment: Participation in nature (Harmony in nature/existence)

Video link:

- https://youtube.com/playlist?list=PLYwzG2fd7hzc4HerTNkc3pS_IvcCfKznV
- https://youtube.com/playlist?list=PLYwzG2fd7hzcZz1DkrAegkKF4TseekPFv

Presentation: https://fdp-si.aicte-india.org/AicteSipUHV_download.php

Module-2	L1, L2	3 Hrs
Introduction to Value Education: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education), Self-exploration as the Process for Value Education, Happiness and Prosperity – Current Scenario. **Video link:** • https://www.youtube.com/watch?v=85XCw8SU084 • https://www.youtube.com/watch?v=E1STJoXCXUU&list=PLWDeKF97v9SP_Kt6jqzA3pZ3yA7g_OAQz • https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw		
Module-3	**L1, L2**	**3 Hrs**
Introduction to Harmony in the Human Being: Understanding Human being as the Co-existence of the Self and the Body, The Body as an Instrument of the Self, Harmony of the Self with the Body. **Video link:** • https://www.youtube.com/watch?v=GpuZo495F24 • https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw		
Module-4	**L1, L2**	**3 Hrs**
Introduction to Harmony in the Family and Society: Harmony in the Family – the Basic Unit of Human Interaction, Other Feelings, Justice in Human-to-Human Relationship, Understanding Harmony in the Society. **Video link:** • https://www.youtube.com/watch?v=F2KVW4WNnS8 • https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw		
Module-5	**L1, L2**	**3 Hrs**
Introduction to Implications of the Holistic Understanding: Natural Acceptance of Human Values, Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Holistic Technologies, Production Systems and Management Models-Typical Case Studies. **Video link:** • https://www.youtube.com/watch?v=BikdYub6RY0 • https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw		
Course outcomes: On completion of the course, students would be able to		
CO1	Develop a holistic perspective about life	

CO2	Explore his/her role (value) in all aspects of living – as an individual, as a member of a family, as a part of the society as an unit in nature
CO3	Become more responsible in life, and in handling problems with sustainable solutions
CO4	Have better critical ability
CO5	Become sensitive to their commitment

Scheme of Evaluation

Details		Marks
Assessment by Faculty mentor (Class Room Evaluation)	CIE(50)	10
Self-Assessment + Assessment by peers		20
Activities / Experimentations related to courses/Assignment		10
Mini Projects / Case Studies		10
Semester End Examination	SEE (50)	50
	Total	100

Text Books:

1.	AICTE SIP UHV-I Teaching Material, https://fdp-si.aicte india.org/ AicteSipUHV _download.php
2.	A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
3.	Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books:

1.	Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010
2.	Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.

3.	Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
4.	The Story of Stuff (Book).
5.	The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1				2	2	3	2	1	2	1
CO2		1				2	2	3	2	1	2	1
CO3		1				2	2	3	2	1	2	1
CO4		1				2	2	3	2	1	2	1
CO5		1				2	2	3	2	1	2	1

High-3, Medium-2, Low-1

Course Title	Additional Mathematics-I (Common to all branches)	Semester	III
Course Code	MVJ20MATDIP31	CIE	50
Total No. of Contact Hours	40	SEE	50
No. of Contact Hours/week	3, L:T:P :: 2:1:0	Total	100
Credits	-	Exam. Duration	3 Hours

Course objective is to: This course viz., aims to prepare the students:

To familiarize the important and basic concepts of Differential calculus and Differential Equation, ordinary/partial differential equations and Vector calculus and analyse the engineering problems.

Module-1	L1, L2, L3	8Hrs.

Differential calculus: Recapitulations of successive differentiations -n^{th} derivative - Leibnitz theorem and Problems, Mean value theorem -Rolle's theorem, Lagrange's Mean value theorem , Cauchy's theorem and Taylor's theorem for function of one variables.

Video Link:
https://users.math.msu.edu/users/gnagy/teaching/ode.pdf

Module-2	L1, L2, L3	8Hrs.

Integral Calculus:

Review of elementary Integral calculus, Reduction formula
$\int_0^{\frac{\pi}{2}} sin^m x\, dx$,$\int_0^{\frac{\pi}{2}} cos^m x\, dx$, $\int_0^{\frac{\pi}{2}} sin^m cos^n x\, dx$ and problems.

Evaluation of double and triple integrals and Simples Problems.

Video Link:
https://www.youtube.com/watch?v=rCWOdfQ3cwQ

https://nptel.ac.in/courses/111/105/111105122/

Module-3	L1, L2, L3	8Hrs.

Vector Calculus: Derivative of vector valued functions, Velocity, Acceleration and related problems, Scalar and Vector point functions, Gradient, Divergence, Curl, Solenoidal and Irrotational vector fields. Vector identities - div (φA), curl (φA), curl (grad φ), div (curl A).

Video Link:
https://www.whitman.edu/mathematics/calculus_online/chapter16.html

https://www.math.ust.hk/~machas/vector-calculus-for-engineers.pdf

Module-4	L1, L2, L3	8Hrs.
Probability: Introduction-Conditional Probability, Multiplication theorem ,Independent events ,Baye's theorem and Problems. **Video Link:** https://www.khanacademy.org/math/statistics-probability/probability-library https://nptel.ac.in/courses/111/105/111105041/		
Module-5	**L1, L2, L3**	**8Hrs.**
Differential equation: Homogenous differential equation, Linear differential equation, Bernoulli's differential equation and Exact differential equation. **Video Link:** https://www.mathsisfun.com/calculus/differential-equations.html		
Course outcomes:		
CO1	Apply the knowledge of Differential calculus in the modeling of various physicaland engineering phenomena	
CO2	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.	
CO3	Study on Vector calculus to understand the various solution to Application to Engineering problems.	
CO4	Understand the basic Concepts of Probability	
CO5	Solve first order linear differential equation analytically using standard methods.	
Text Books:		
1	B.S. Grewal, "Higher Engineering Mathematics" Khanna Publishers, 43rd Edition 2013.	
2	Ramana B. V., "Higher Engineering Mathematics", Tata Mc Graw-Hill, 2006.	
Reference Books:		
1	Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley-India publishers, 10thedition,2014.	
2	G. B. Gururajachar: Calculus and Linear Algebra, Academic Excellent Series Publication, 2018-19	
CIE Assessment:		

CIE is based on quizzes, tests, assignments/seminars and any other form of evaluation. Generally, there will be: Three Internal Assessment (IA) tests during the semester (30 marks each), the final IA marks to be awarded will be the average of three tests

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i. Question paper for the SEE consists two parts i.e. Part A and Part B. Part A is compulsory and consists of objective type or short answer type questions of 1 or 2 marks each for total of 20 marks covering the whole syllabus.
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CO2	2	3	-	3	-	-	-	-	-	-	1	1
CO3	2	2	-	2	-	-	-	-	-	-	1	-
CO4	3	2	-	3	-	-	-	-	-	-	-	1
CO5	3	3	-	2	-	-	-	-	-	-	-	-