DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

ACADEMIC YEAR 2020-21

SYLLABUS

VISION

To evolve into a centre of excellence in Electrical and Electronics Engineering for bringing out contemporary engineers, innovators, researchers and entrepreneurs for serving nation and society.

MISSION

- To provide suitable forums to enhance the teaching-learning, research and development activities.
- Framing and continuously updating the curriculum to bridge the gap between industry and academia in the contemporary world and serve society.
- To inculcate awareness and responsibility towards the environment and ethical values.

.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1	To provide good learning environment to develop entrepreneurship capabilities in various areas of Electrical and Electronics Engineering with enhanced efficiency, productivity, cost effectiveness and technological empowerment of human resource.
PEO2	To inculcate research capabilities in the areas of Electrical and Electronics Engineering to identify, comprehend and solve problems and adopt themselves to rapidly evolving technology.
PEO3	To create high standards of moral and ethical values among the graduates to transform them as responsible citizens of the nation.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1	Graduateswill be able to solve real life problems of power system and power Electronics using MiPower, PSPICE and MATLAB software tools and hardware.
PSO 2	Graduates will be able to Develop & support systems based on Renewable and sustainable Energy sources.

PEOs TO MISSION STATEMENT MAPPING

Mission Statements	PEO1	PEO2	PEO3
PEO1: To provide good learning environment to develop entrepreneurship capabilities in various areas of Electrical and Electronics Engineering with enhanced efficiency, productivity, cost effectiveness and technological empowerment of human resource.	3	3	1
PEO2: To inculcate research capabilities in the areas of Electrical and Electronics Engineering to identify, comprehend and solve problems and adopt themselves to rapidly evolving technology	2	3	2
PEO3: To create high standards of moral and ethical values among the graduates to transform them as responsible citizens of the nation.	1	2	3

Correlation: 3- High, 2-Medium, 1-Low

PROGRAM OUTCOMES (POs) WITH GRADUATE ATTRIBUTES

S.No	Graduate Attributes	Program Outcomes (POs)
1	Engineering Knowledge	PO1: Able to understand the fundamentals of mathematics, science, Electrical and Electronics Engineering and apply them to the solution of complex engineering problems.
2	Problem Analysis	PO2: Ability to identify, formulate and analyze real time problems in Electrical and Electronics Engineering.
3	Design and Development of Solutions	PO3: Design solutions for complex engineering problems, that meet the specified needs and to interpret the data.
4	Investigation of Problem	PO4: Use research based knowledge and research methods to provide valid solutions for complex problems in Electrical and Electronics Engineering.
5	Modern Tool usage	PO5: Apply appropriate tools techniques for modeling, analyzing and solving Electrical and Electronics Engineering devices & systems.
6	Engineer and society	PO6: To give basic knowledge of social, economic, safety and cultural issues relevant to professional engineering.
7	Environment and sustainability	PO7: To impart knowledge related to the design and development of modern systems which are environmentally sensitive and to understand the importance of sustainable development.
8	Ethics	PO8: Apply ethical principles and professional responsibilities in engineering practice.
9	Individual & team work	PO9: Ability to visualize and function as an individual and as a member in a team of a multi-disciplinary environment.
10	Communication	PO10: Ability to communicate effectively complex engineering ideas to the engineering community & the society at large.
11	Lifelong learning	PO11: To impart education to learn and to engage in independent and life – long learning in the technological change.

12	Project management and finance	PO12: Ability to handle administrative responsibilities, manage projects & handle finance related issues in a multi-disciplinary environment.

MAPPING OF POs TO PEOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	3	3	3	-	-	-	-	-	-	-	-	-
PEO2	-	-	-	-	-	-	-	-	-	-	-	-
PEO3	-	-	3	3	-	-	-	-	-	-	3	-

Correlation: 3- High, 2-Medium, 1-Low

New Horizon College of Engineering
Department of Electrical and Electronics Engineering
Scheme of Third Semester B.E Program

S. No	Course Code	Course	BOS	Credit Distribution			Overall Credits	Contact Hours per Week	Marks		
				L	T	P			CIE	SEE	Total
1	19EEE31	Applied Mathematics-III	BS	2	1	0	3	4	50	50	100
2	19HSS321	Economics for Engineers	HSS	2	0	0	2	2	25	25	50
3	20HSS324/ 20HSS325	Aadalitha Kannada/ Vyavaharika Kannada	HSS	1	0	0	1	2	25	25	50
4	19EEE33	Electronic Devices and Circuits	EEE	3	1	0	4	5	50	50	100
5	19EEE34	Digital System Design	EEE	3	1	0	4	5	50	50	100
6	19EEE35	Electric Circuit Theory	EEE	3	1	0	4	5	50	50	100
7	19EEL36	Analog and Digital Electronics Laboratory	EEE	0	0	1.5	1.5	3	25	25	50
8	19EEL37	Electric Circuit Theory Laboratory	EEE	0	0	1.5	1.5	3	25	25	50
9	19EEL38	Mini Project I	EEE	-	-	-	2	-	25	25	50
10	19DMAT31	Basic Applied Mathematics-I	BS	0	0	0	0	2	25	25	50
		TOTAL					**23**	**31**	**350**	**350**	**700**

New Horizon College of Engineering
Department of Electrical and Electronics Engineering
Scheme of Fourth Semester B.E Program

S. No	Course Code	Course	BOS	Credit Distribution			Overall Credits	Contact Hours per Week	Marks		
				L	T	P			CIE	SEE	Total
1	19EEE41	Applied Mathematics-IV	BS	2	1	0	3	4	50	50	100
2	19HSS422	Life Skills for Engineers	HSS	3	0	0	3	3	50	50	100
3	19HSS423	Environmental Science and Awareness	HSS	Mandatory Course			0	1	25	25	50
4	19EEE43	Electromagnetic Theory	EEE	3	0	0	3	3	50	50	100
5	19EEE44	Microcontroller and Embedded Systems	EEE	3	0	0	3	3	50	50	100
6	19EEE45	DC Machines and Transformers	EEE	3	0	0	3	3	50	50	100
7	19EEE46	Linear Integrated Circuits	EEE	3	0	0	3	3	50	50	100
8	19EEL47	Microcontroller and Embedded Systems Laboratory	EEE	0	0	1.5	1.5	3	25	25	50
9	19EEL48	DC Machines and Transformers Laboratory	EEE	0	0	1.5	1.5	3	25	25	50
10	19EEL49	Mini Project II	EEE	-	-	-	2	-	25	25	50
11	19DMAT41	Basic Applied Mathematics-II	BS	0	0	0	0	2	25	25	50
		TOTAL					**23**	**28**	**425**	**425**	**850**

SYLLABUS

III SEMESTER

APPLIED MATHEMATICS – III

Course Code : 19ECE31/19EEE31 **Credits : 03**
L:T:P : 2:1:0 **CIE Marks : 50**
Exam Hours : 03 **SEE Marks : 50**

Course Outcomes: At the end of the Course, the Student will be able to do the following:

CO1	Use appropriate numerical methods to solve algebraic equations and transcendental equations and also Evaluate a definite integral numerically
CO2	Evaluate a definite integral numerically and Use appropriate numerical methods to solve Boundary Value Problems in Partial differential equations
CO3	Fit a suitable curve by the method of least squares and determine the lines of regression for a set of statistical data and obtain the extremal of a functional.
CO4	Express the periodic functions as Fourier series expansion analytically and numerically
CO5	Solve the Continuous model problems using Fourier transforms
CO6	Solve the discrete model problems using Z-transforms

Mapping of Course Outcomes to Program Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	2	2	-	-	-	1	1	-	2
CO2	3	3	3	2	2	-	-	-	1	1	-	2
CO3	3	3	3	2	2	-	-	-	1	1	-	2
CO4	3	3	3	2	2	-	-	-	1	1	-	2
CO5	3	3	3	2	2	-	-	-	1	1	-	2
CO6	3	3	3	2	2	-	-	-	1	1	-	2

Course Syllabus			
Module No.	**Contents of the Module**	**Hours**	**Co's**
1.	**Numerical Methods-1:** Numerical solution of algebraic and transcendental equations: Regula-falsi method and Newton-Raphson method-Problems. Interpolation: Newton's forward and backward formulae for equal intervals, Newton divided difference and Lagrange's formulae for unequal intervals (without proofs)-Problems.	**9L + 2T**	**CO1**
2.	**Numerical Methods-2**: Numerical integration: Simpson's 1/3rd rule, Simpson's 3/8th rule, Weddle's rule (without proofs)-Problems.	**9L**	

	Numerical solution of one-dimensional wave equation, heat equation and two-dimensional Laplace's equation. **Applications:** Application of numerical integration to velocity of a particle and volume of solids.	**+** **2T**	**CO2**
3.	**Statistical Methods and Calculus of Variation:** Fitting of the curves of the form $y = a + bx$, $y = a + bx + cx^2$, $y = ae^{bx}$, $y = ax^b$, and $y = ab^x$ by the method of least square-Problems.Correlation and Regression lines-Problems. Variation ofa function and a functional, variational problems, Euler's equation and Isoperimetric problems. **Applications:** Minimal surface of revolution and Hanging cable.	**9L** **+** **2T**	**CO3**
4.	**Fourier series:** Periodic function, Dirichlet's conditions, Fourier series of periodic functions of period 2π and arbitrary period $2l$, half range series-Problems. **Applications:** Fourier series and half Range Fourier series of periodic square wave, half wave rectifier, full wave rectifier, Saw-tooth wave with graphical representation, practical harmonic analysis-Problems.	**9L** **+** **2T**	**CO4**
5.	**Fourier Transforms:** Infinite Fourier transforms, Fourier Sine and Cosine transforms, Inverse Fourier sine and cosine transforms. **Z - Transform**: Definition, Z-transforms of some standard functions , properties, damping rule, shifting rule(without proof), initial and final value theorems, inverse Z- transforms by partial fractions method. **Applications:** Solving difference equations using Z-transform.	**9L** **+** **2T**	**CO5, CO6**

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley-India Publishers, 10th Edition, 2014, ISBN: 978-81-265-5423-2.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014, ISBN: 978-81-7409-195-5.

Reference Books:

1. Glyn James, Modern Engineering Mathematics, Prentice Hall, 4th Edition, 2015, ISBN: 978-0-273-73409-3
2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education (India) Private Limited, 4th Edition, 2016, ISBN: 978-0-07-063419-0.
3. H. K. Dass, Advanced Engineering Mathematics, S. Chand & Company Ltd., 28th Edition, 2012, ISBN: 81-219-0345-9.
4. N.P.Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications (P) Ltd., 9th Edition, 2014, ISBN: 978-81-318-0832-0.

Assessment Pattern:

1. CIE- Continuous Internal Evaluation (50 Marks):

Bloom's Category	Tests (25 Marks)	Assignments (15 Marks)	Quizzes (10 Marks)
Remember	5	5	-
Understand	5	5	-
Apply	5	5	10
Analyze	5	-	-
Evaluate	5	-	-
Create	-	-	-

2. SEE- Semester End Examination (50Marks):

Bloom's Category	Questions (50 Marks)
Remember	10
Understand	10
Apply	20
Analyze	5
Evaluate	5
Create	-

ELECTRONIC DEVICES AND CIRCUITS

Course Code	**: 19EEE33**	**Credits**	**: 04**
L: T: P	**: 3:1:0**	**CIE Marks**	**: 50**
Exam Hours	**: 03**	**SEE Marks**	**: 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Investigate the characteristics of various semiconductor devices at different conditions
CO2	Analyze the biasing circuits of BJT and FET and choose the appropriate circuit for amplification and switching applications
CO3	Construct wave shaping, rectification and amplification circuits
CO4	Design multistage power amplifiers and oscillator circuits for the given specifications
CO5	Evaluate the effects of different types of negative and positive feedback amplification
CO6	Utilize simulation tools for performance analysis of a real time analog circuit.

Mapping of Course Outcomes to Program Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	-	3	-	-	-	-	-	-	-	-
CO2	3	3	2	3	-	-	-	-	-	-	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	-
CO4	3	3	3	3	-	-	-	-	-	-	-	-
CO5	3	3	3	3	-	-	-	-	-	-	-	-
CO6	3	2	2	2	3	-	-	-	-	-	-	-

Module No	**Contents of the Module**	**Hours**	**COs**
1	**Diode Circuits and other devices:** PN Junction Diode - Diode equivalent circuits -Diode Clipping and Clamping circuits - Power Supplies -LED - Laser diode- Zener diode - IR emitters- photo diode and solar cell.	09	CO3 CO1 CO6

2	**Transistor DC Biasing and Modeling:** BJT – NPN and PNP transistor - Operating point - Analysis and design of Fixed bias circuit - Emitter stabilized bias circuit - Voltage divider bias circuit - Stability factor- Transistor switching circuits - BJT transistor modeling, r_e model and hybrid equivalent model - Analysis of CE Fixed bias configuration - Voltage divider bias, Emitter follower - CB configuration using approximate hybrid model.	09	CO2 CO1
3	**Multistage and Power Amplifiers:** Frequency Response of CE single stage amplifier - Need for cascading - Cascade and Cascade connection - Darlington connection - Definitions and amplifier types - Transformer coupled Class A amplifiers - Class B amplifier circuits - Amplifier distortion.	09	CO4 CO3 CO6
4	**Feedback Amplifier and Oscillator:** Feedback concept - Effects of Negative Feedback - Feedback connection types - Practical feedback circuits - Barkhausen criterion - analysis and working of Phase shift Oscillator - Wien-bridge Oscillator -Tuned Oscillator circuits - Crystal Oscillator	09	CO4 CO5
5	**FETs:** Construction and working of MOSFET - Biasing of MOSFET - Analysis and design of MOSFET amplifiers - Simulation of analog circuits using PSpice - case studies - PLL and SMPS industrial application	09	CO1 CO2 CO6

Text Books:

1. Electronic Devices and Circuit Theory, Robert L. Boylestad and Louis Nashelsky, PHI, 11th Edition, 2015.
2. Electronics Devices and Circuits, David A. Bell, PHI, 5th Edition, 2008.

Reference Books:

1. Integrated Electronics, Jacob Millman& Christos C. Halkias, Tata - McGraw Hill, 2nd Edition, 2010.
2. Fundamentals of Analog Circuits, Thomas L Floyd, Pearson, 2nd edition, 2012
3. Electronic Devices and Circuits, S.Salivahanan, N.Suresh, McGraw Hill, 3rd edition, 2013

Assessment Pattern:

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	**Test**	**Assignment**	**Quiz**	**Curricular/Co-Curricular Activities**
Marks (Out of 50 Marks)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	-	-	-	-

Understand	5	-	2	-
Apply	10	5	3	-
Analyze	5	5		10
Evaluate	5	-	-	-
Create	-	-	-	-

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	**Test Marks (Out of 50 Marks)**
Remember	5
Understand	10
Apply	20
Analyze	10
Evaluate	5
Create	-

DIGITAL SYSTEM DESIGN

Course Code	**: 19EEE34**	**Credits**	**: 04**
L: T: P	**: 3:1:0**	**CIE Marks**	**: 50**
Exam Hours	**: 03**	**SEE Marks**	**: 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Choose appropriate Boolean reduction technique for digital logic circuit design
CO2	Build the combinational logic circuits
CO3	Analyze various synchronous and asynchronous digital logic circuits
CO4	Design sequential logic circuits for various applications
CO5	Construct optimized digital circuits for the desired specification
CO6	Develop Verilog code for digital system design

Mapping of Course Outcomes to Program Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	1	-	-	-	-	-	-	-	-
CO2	3	3	3	2	-	-	-	-	-	-	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	-
CO4	3	3	3	2	-	-	-	-	-	-	-	-
CO5	3	3	3	2	-	-	-	-	-	-	-	-
CO6	3	3	3	-	3	-	-	-	-	-	-	-

Module No	**Contents of the Module**	**Hours**	**COs**
1	**Combinational logic circuits:** Definition of digital system, combinational logic circuits, Canonical forms, Generation of switching equations from truth tables, Karnaugh maps-3, 4 and 5 variables, Incompletely specified functions (Don't Care terms), Simplifying Max term equations. Design of combination circuits using NAND and NOR gates. Quine-McCluskey minimization technique, Quine-McCluskey using Don't care terms, Map entered variable. Logic families: DTL, RTL, TTL and CMOS logic gates.	09	CO1, CO5

2	**Analysis and design of combinational logic circuits:** Adders and subtractors, Cascading full adders, Look ahead carry, Binary comparators, Decoders-Encoders, Priority encoders. Digital multiplexers, Using multiplexers as Boolean function generators, Demultiplexers.	09	CO2, CO5
3	**Sequential logic circuits:** Basic Bistable Element, Latches, SR Latch, gated SR Latch, gated D Latch, Characteristics equations of latches. Flip-flops-SR,JK,D,T, Master-Slave SR Flip-Flops, Master-Slave JK Flip-Flops, Registers, Types of shift – registers,	09	CO3, CO5
4	**Design of sequential logic circuits:** Design of asynchronous & synchronous counters, binary counters, Counters based on Shift Registers, Design of a Synchronous Modulo Counter using clocked Flip-Flops. Concept of states, state diagram, state table & state assignment. Mealy & Moore state models.	09	CO4, CO5
5	**Verilog HDL:** Introduction, A brief history of HDL, Structure of HDL Module, Operators, Data types, Types of Descriptions, Simulation and synthesis. Design of combinational, sequential logic circuits and state machines using Verilog	09	CO6

Text Books:

1. Digital Design, M. Morris Mano, Pearson Education, 5th Edition, 2017.
2. Fundamentals of logic design, Charles H Roth.Jr, Thomson Learning, 7th Edition, 2016.
3. Digital Logic Applications and Design, John M Yarbrough, Thomson Learning, 8th Edition, reprint 2017.
4. Verilog HDL: A Guide to Digital Design and Synthesis, S. Palnitkar, Pearson Education, Second Edition, 2015.

Reference Books:

1. Digital electronics, B.R.Gupta, V.Singhal, S.K Kataria& sons, 7thEdition, 2014.
2. Logic and computer design Fundamentals, Mono and Kim, Prentice Hall, 5th Edition, 2015.
3. Fundamentals of digital logic with Verilog design, S. Brown and Z. Vranesic, McGraw-Hill, Third Edition, 2013

Assessment Pattern:

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	Test	Assignment	Quiz	Curricular/Co-Curricular Activities
Marks (Out of 50 Marks)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	-	-	-	-
Understand	-	-	-	-
Apply	6	2	1	10
Analyze	7	3	2	-
Evaluate	6	2	1	-
Create	6	3	1	-

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	Test Marks (Out of 50 marks)
Remember	-
Understand	-
Apply	15
Analyze	15
Evaluate	10
Create	10

ELECTRIC CIRCUIT THEORY

Course Code : 19EEE35 | **Credits : 04**
L: T: P : 3:1:0 | **CIE Marks : 50**
Exam Hours : 03 | **SEE Marks : 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Analyse circuit parameters using network reduction techniques
CO2	Solve DC and AC circuits using network theorems
CO3	Obtain the frequency response of RLC circuits
CO4	Investigate the transient response of RLC circuits with DC and AC excitation
CO5	Analyze three phase circuits with different connections
CO6	Build an electric system for a given application

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	-	-	-	-	-	-	-	-
CO2	3	3	3	3	-	-	-	-	-	-	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	-
CO4	3	3	3	3	-	-	-	-	-	-	-	-
CO5	3	3	3	3	-	-	-	-	-	-	-	-
CO6	3	3	3	3	-	-	-	-	-	-	-	-

Module No	Contents of the Module	Hours	COs
1	**Network Reduction** Practical and ideal sources, active and passive elements, dependent and independent sources. Mesh Analysis and Nodal Analysis of DC and AC Circuits- Super-Mesh and Super-Node. Network reduction of series and parallel resistors, star-delta transformation and Source transformation	09	CO1, CO6
2	**Network Theorems** Superposition theorem- Thevenin's theorem, Norton's theorem - Maximum power transfer theorem-Reciprocity theorem-Substitution Theorem-Compensation theorem	09	CO2, CO6

3	**Resonance** Series, parallel, Series-Parallel circuits- effect of variation of Q on resonance. Relations between circuit parameters- Q, resonant frequency and bandwidth. **Coupled Circuits** Mutual Inductance, Coefficient of Coupling, Dot convention, Equivalent inductance of series and parallel connected inductors with mutual inductance, Analysis of coupled circuits.	09	CO3, CO6
4	**Transient Analysis** Source Free RL, RC and RLC Circuits, Step and sinusoidal Response of RL, RC and RLC Circuits .	09	CO4, CO6
5	**Three Phase Circuits** Analysis of Balanced and Unbalanced three phase systems. Disadvantage and causes of (low power factor) LPF, Power factor improvement equipment's, Power factor correction of single phase and three phase circuits.	09	CO5, CO6

Text Books:

1. Electric Circuit Analysis, VanWalgenberg, Prentice hall of India, 3rd edition, 2015.
2. Engineering circuit analysis, Hayt and Kemmerly, McGraw Hill, 6th edition, 2012.

Reference Books:

1. Circuits and Networks Analysis and Synthesis, A. Sudhakar and S.P.Shyammohan, TMH, 10th edition, 2015.
2. Analysis of Linear Systems, David K. Cheng, Narosa Publishing House ,11th reprint, 2012.
3. Electrical networks, Ravish R Singh, McGraw-Hill Company, 3rd Edition, 2013.

Assessment Pattern

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	**Test**	**Assignment**	**Quiz**	**Curricular/Co-Curricular Activities**
Marks (Out of 50 Marks)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	-	-	-	-
Understand	-	-	-	-
Apply	10	2	2	-
Analyze	5	3	2	-
Evaluate	5	5	1	5
Create	5	-	-	5

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	Test Marks (Out of 50 Marks)
Remember	-
Understand	-
Apply	20
Analyze	15
Evaluate	10
Create	5

ANALOG AND DIGITAL ELECTRONICS LABORATORY

Course Code : 19EEL36 **Credits: 1.5**
L:T:P :0:0:1.5 **CIE Mark : 25**
Exam Hours : 03 **SEE Marks: 25**

Course Outcomes: At the end of the course, the students will be able to

CO1	Analyze the characteristics of semiconductor diodes and implement voltage regulator, clipper, clamper, rectifier and filter
CO2	Design series voltage regulator, RC coupled amplifier, Class B Push-Pull amplifier and RC phase shift oscillator
CO3	Construct adder &subtractor circuits, code converters, multiplexer &demultiplexer using appropriate combinational logic circuitry
CO4	Build synchronous/ asynchronous sequential circuits for the desired specifications

Mapping of Course Outcomes to Program Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	2	-	-	-	-	2	2	-	-
CO2	3	3	2	2	-	-	-	-	2	2	-	-
CO3	3	3	3	3	-	-	-	-	2	2	-	-
CO4	3	3	3	3	-	-	-	-	2	2	-	-

SYLLABUS		
S.No.	**List of experiments**	**COs**
1.	Study of Half-wave rectifiers with and without capacitor filter	CO1
2.	Study of Full-wave rectifiers with and without capacitor filter	CO1
3.	Clipper and clamper circuits	CO1
4.	Zener voltage regulator	CO1
5.	Design and Implementation of Series Voltage Regulator	CO2
6.	Design and Implementation of RC coupled amplifier	CO2
7.	Design and Implementation of Class B Push-Pull amplifier	CO2
8.	Design and Implementation of RC Phase Shift Oscillator	CO2
9.	Study of Basic Digital ICs	CO3
10.	Implementation of Adder and Subtractor circuits	CO3
11.	Design and Implementation of Code converters	CO3
12.	Design and Implementation of Multiplexer and Demultiplexer	CO3
13	Design and Implementation of Counters and Shift registers	CO4

Assessment Pattern:

CIE-Continuous Internal Evaluation Lab (25 Marks):

Blooms levels	CIE –LAB (25 Marks)	
	Assessment on Performance (10 Marks)	Internal Lab Examination (15 Marks)
Remember	2	2
Understand	3	3
Apply	3	5
Analyze	2	5
Evaluate	-	-
Create	-	-

SEE – Semester End Examination Lab (25 Marks):

Bloom's Taxonomy	External Lab Examination (25 Marks)
Remember	3
Understand	5
Apply	9
Analyze	8
Evaluate	-
Create	-

ELECTRIC CIRCUIT THEORY LABORATORY

Course Code : 19EEL37 **Credits: 1.5**

L: T: P : 0:0:1.5 **CIE Marks : 25**

Exam Hours : 03 **SEE Marks : 25**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Reduce and analyze the given network using star-delta and source transformation techniques
CO2	Verify experimentally mesh and nodal analyses
CO3	Investigate the application of network theorems
CO4	Assess the transient response of RL,RC and RLC circuits and evaluate the frequency response of a RLC circuit and steady state response of a mutually coupled circuit

Mapping of Course Outcomes to Program Outcomes:

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

S. No.	LIST OF EXPERIMENTS	COs
1	Network Reduction using Series-Parallel Combination	CO1
2	Network Reduction using Star-Delta Transformation	CO1
3	Network Reduction and Analysis using Source Transformation	CO1
4	Network Analysis using Mesh-Current Method	CO2
5	Network Analysis using Node-Voltage Method	CO2
6	Verification of Superposition Theorem	CO3
7	Verification of Thevenin's Theorem & Norton's Theorem	CO3
8	Verification of Maximum Power Transfer Theorem	CO3
9	Determination of Resonant Frequency, Bandwidth and Quality Factor of a RLC Circuit	CO4
10	Transient and steady state analysis of RL and RC circuits	CO4
11	Transient and steady state analysis of RLC circuits	CO4
12	Steady State Analysis of Mutually Coupled Circuits	CO4

Assessment Pattern:

CIE-Continuous Internal Evaluation Lab (25 Marks):

Blooms levels	CIE –LAB (25 Marks)	
	Assessment on Performance (10 Marks)	Internal Lab Examination (15 Marks)
Remember	-	-
Understand	2	-
Apply	4	10
Analyze	2	5
Evaluate	2	5
Create	-	5

SEE – Semester End Examination Lab (25 Marks):

Bloom's Taxonomy	External Lab Examination (25 Marks)
Remember	-
Understand	-
Apply	10
Analyze	5
Evaluate	5
Create	5

BASIC APPLIED MATHEMATICS-I

Course Code : 19DMAT31 **Credits : 00**
L:T:P : 0:0:0 **CIE Marks : 25**
Exam Hours : 02 **SEE Marks : 25**

Course Outcomes: At the end of the Course, the Student will be able to do the following:

CO1	Learn the principles of engineering mathematics through calculus
CO2	Determine the power series expansion of a function
CO3	Find the definite integrals with standard limits and Also develop the ability to solve different types of differential equations
CO4	Apply ideas from linear algebra in solving systems of linear equations and Determine the Eigen values and Eigen vectors of a matrix

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2	-	-	-	1	1	-	1
CO2	3	2	3	2	2	-	-	-	1	1	-	1
CO3	3	2	3	2	2	-	-	-	1	1	-	1
CO4	3	2	3	2	2	-	-	-	1	1	-	1

Course Syllabus

Module No.	Contents of the Module	Hours	CO's
1.	**Differential Calculus:** Polar curves-Problems on angle between the radius vector and tangent, Angle between two curves-Problems, Pedal equation for polar curves-Problems. Macluren's theorems for function of one variable (statement only)-Problems.	**5L**	**CO1, CO2**
2.	**Partial differentiation:** Definition and Simple problems, Euler's theorem for Homogeneous function (NO Derivation and NO extended theorem)-Problems, Partial differentiation of composite functions (chain rule)-Problems, Jacobians of order two - definition and problems.	**5L**	**CO1**
3.	**Integral Calculus and Differential Equations:** Problems on reduction formulae for functions $\sin^n x$, $\cos^n x$, Problems on evaluation of these integrals with standard limits (0 to $\pi/2$). Solution of first order and first degree differential equations-Variable separable, Linear and Exact differential equations.	**5L**	**CO3**
4.	**Linear Algebra-1:** Problems on rank of a matrix by elementary	**5L**	

	transformations, consistency of a system of linear equations and solution (homogeneous and non-homogeneous)-Problems. Solution of system of linear equations by Gauss elimination method-Problems.		**CO4**
5.	**Linear Algebra-2:** Linear transformation, Eigen values and Eigen vectors, diagonalisation of a square matrix-Problems.	**5L**	**CO4**

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley-India Publishers, 10th Edition, 2014, ISBN: 978-81-265-5423-2.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014, ISBN: 978-81-7409-195-5.

Reference Books:

1. Glyn James, Modern Engineering Mathematics, Prentice Hall, 4th Edition, 2015, ISBN: 978-0-273-73409-3
2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education (India) Private Limited, 4th Edition, 2016, ISBN: 978-0-07-063419-0.
3. H. K. Dass, Advanced Engineering Mathematics, S. Chand & Company Ltd., 28th Edition, 2012, ISBN: 81-219-0345-9.
4. N.P.Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications (P) Ltd., 9th Edition, 2014, ISBN: 978-81-318-0832-0.

Assessment Pattern:

1. CIE- Continuous Internal Evaluation (25 Marks)

Bloom's Category	Tests (20 Marks)	Assignment (5 Marks)
Remember	5	-
Understand	5	5
Apply	5	-
Analyze	2.5	-
Evaluate	2.5	-
Create	-	-

2. SEE- Semester End Examination (25 Marks)

Bloom's Category	Questions (25 Marks)
Remember	5
Understand	10
Apply	5
Analyze	2.5
Evaluate	2.5
Create	-

IV SEMESTER
SYLLABUS

APPLIED MATHEMATICS – IV

Course Code: 19ECE41/19EEE41 **Credits : 03**
L:T:P : 2:1:0 **CIE Marks : 50**
Exam Hours : 03 **SEE Marks : 50**

Course Outcomes: At the end of the Course, the Student will be able to do the following:

CO1	Solve initial value problems using appropriate numerical methods
CO2	Understand the concepts of Complex variables to solve Engineering Problems
CO3	Understand the concepts of Transformations, Complex integration, Poles and Residuals in the stability analysis of engineering problems
CO4	Gain ability to use probability distributions to analyze and solve real time problems
CO5	Apply the concept of sampling distribution to solve engineering problems
CO6	Use the concepts to analyze the data to make decision about the hypothesis

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2	-	-	-	1	1	-	1
CO2	3	2	3	2	2	-	-	-	1	1	-	1
CO3	3	2	3	2	2	-	-	-	1	1	-	1
CO4	3	2	3	2	2	-	-	-	1	1	-	1
CO5	3	2	3	2	2	-	-	-	1	1	-	1
CO6	3	2	3	2	2				1	1		1

Course Syllabus

Module No.	Contents of the Module	Hours	CO's
1.	**Numerical Methods:** Numerical solution of ordinary differential equations of first order and of first degree: Modified Euler's method and Runge-Kutta method of fourth-order-Problems. Milne's predictor and corrector methods-Problems. Numerical Solutions of second order ordinary differential equations byRunge-Kutta method of fourth-order-Problems.	**9L + 2T**	**CO1**
2.	**Complex Variables**: Functions of complex variables, Analytical functions, Cauchy-Riemann Equations in Cartesian and Polar forms, Harmonic functions and Construction of analytic functions-Problems using Milne-Thompson's method. **Applications:** Flow problems-Velocity potential, Stream functions and complex potential functions.	**9L + 2T**	**CO2**

3.	**Conformal Transformations and Complex Integrations:** $w = z^2$, $w = e^z$ and $w = z + (1/z)$. Cauchy's Theorem (with proof). Singularities, Poles and Residues, Residue theorem (without proof)-Problems.	**9L + 2T**	**CO3**
4.	**Probability distributions:** Random variables (discrete and continuous), probability density functions. Discrete Probability distributions: Binomial and Poisson distributions-Problems. Continuous Probability distributions: Exponential and Normal distributions-Problems. **Joint Probability distributions:** Mathematical expectation, correlation, covariance (discrete random variables only)-Problems.	**9L + 2T**	**CO4**
5.	**Sampling Theory:** Sampling, Sampling distributions, test of hypothesis of large samples for means and proportions, confidence limits for means, Student's t-distribution, F-distribution and Chi-square distribution for test of goodness of fit for small samples.	**9L + 2T**	**CO5, CO6**

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley-India Publishers, 10th Edition, 2014, ISBN: 978-81-265-5423-2.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014, ISBN: 978-81-7409-195-5.

Reference Books:

1. Glyn James, Modern Engineering Mathematics, Prentice Hall, 4th Edition, 2015, ISBN: 978-0-273-73409-3
2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education (India) Private Limited, 4th Edition, 2016, ISBN: 978-0-07-063419-0.
3. H. K. Dass, Advanced Engineering Mathematics, S. Chand & Company Ltd., 28th Edition, 2012, ISBN: 81-219-0345-9.
4. N.P.Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications (P) Ltd., 9th Edition, 2014, ISBN: 978-81-318-0832-0.

Assessment Pattern:

CIE- Continuous Internal Evaluation (50 Marks):

Bloom's Category	Tests	Assignments	Quizzes

	(25 Marks)	(15 Marks)	(10 Marks)
Remember	5	5	-
Understand	5	5	-
Apply	5	5	10
Analyze	5	-	-
Evaluate	5	-	-
Create	-	-	-

SEE- Semester End Examination (50Marks):

Bloom's Category	Questions (50 Marks)
Remember	10
Understand	10
Apply	20
Analyze	5
Evaluate	5
Create	-

ELECTROMAGNETIC THEORY

Course Code : 19EEE43 **Credits : 03**
L: T: P : 3: 0: 0 **CIE Marks: 50**
Exam Hours : 03 **SEE Marks: 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Apply vector calculus and different coordinate systems for various electromagnetic field computations
CO2	Evaluate electric field, flux and potential for various charge distributions
CO3	Compute various parameters over a wide range using the boundary conditions in a static electric field thereby finding the capacitance for different charge configurations
CO4	Evaluate magnetic field intensity, flux density and potential for various current distributions
CO5	Analyse Maxwell's equations for static and time varying electromagnetic fields, thereby deducing wave equations in lossless and conducting media
CO6	Deduce Poynting theorem and analyse the significance of Poynting Vector for power flow in a transmission line

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	-
CO5	3	3	-	-	-	-	-	-	-	-	-	-
CO6	3	3	-	-	-	-	-	-	-	-	-	-

Module No.	Module Contents	Hrs	COs
1	**Coordinate Systems and Vector Calculus** Coordinate systems – Rectangular, Cylindrical and Spherical coordinate systems – Differential Length, Area, and Volume – Curl, Gradient and Divergence – Divergence theorem and Stoke's theorem	09	CO1
2	**Electric Field, Potential and Energy** Coulomb's Law – Electric field intensity – Line charge, surface charge and volume charge distributions – Gauss' law – Electric flux density Potential – Potential difference – Potential gradient – Energy in Electrostatic field – Energy density	09	CO2
3	**Electrostatic boundary value problems and Conductors** Boundary conditions in dielectrics – Poisson and Laplace equations – Capacitance	09	CO3

	Conductors– Current and current density – Conduction and convection – Continuity of current		
4	**Magnetostatics** Biot-Savart's Law – Magnetic field intensity – Magnetic flux density – Ampere's Circuital Law – Scalar and Vector Magnetic Potentials – Force and Torque – Magnetic Boundary Conditions	09	CO4
5	**Time varying fields and Wave propagation** Faraday's law – Displacement current – Maxwell's equations for static and time varying fields – Poynting's theorem and Wave power Wave equations – Wave propagation in Conductors, dielectrics and free space	09	CO5, CO6

Text Books:

1. Engineering Electromagnetics, William H Hayt Jr. and John A Buck, Tata McGraw-Hill, 8th edition, 2014.
2. Principles of Electromagnetics, Matthew N.O.Sadiku, Oxford University Press, 4th Edition, 2009.
3. Electromagnetics, Schaum'sOutline series, Joseph A Ediminister, Tata McGraw –Hill, revised second Edition, 2014.

Reference Books:

1. Electromagnetics with Applications, John Krauss and Daniel A Fleisch, McGraw Hill, 5th edition, 1999.
2. Field and Wave Electromagnetics, David K Cheng, Pearson Education Asia, 2nd edition, Indian Reprint – 2001.
3. Electromagnetism – Theory and Applications, AshutoshPramanik, Prentice Hall of India Private Limited, 2nd Edition, 2006.

Assessment Pattern

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	**Test**	**Assignment**	**Quiz**	**Curricular/Co-Curricular Activities**
Marks (Out of 50)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	5	-	2	-
Understand	5	5	3	-
Apply	5	2	-	10
Analyze	5	3	-	-
Evaluate	5	-	-	-

Create	-	-	-	-

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	**Test Marks (Out of 50)**
Remember	10
Understand	18
Apply	10
Analyze	9
Evaluate	3
Create	-

MICROCONTROLLER AND EMBEDDED SYSTEMS

Course Code	**: 19EEE44**	**Credits**	**: 03**
L: T: P	**: 3:0:0**	**CIE Marks**	**: 50**
Exam Hours	**: 03**	**SEE Marks**	**: 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Apply the concepts of embedded systems and addressing modes to develop programs
CO2	Develop complex assembly language programs using 8051
CO3	Construct embedded C programs using 8051 special function registers
CO4	Expand programs to interface 8051 with external devices
CO5	Realize embedded system concepts withATMEGA2560 for engineering applications
CO6	Deploy appropriate embedded system design for complex engineering tasks

Mapping of Course Outcomes to Program Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**POI0**	**POII**	**PO12**
CO1	-	3	-	-	-	-	-	-	-	-	-	3
CO2	3	1	1	2	3	-	-	-	1	1	-	-
CO3	-	-	3	-	3	3	3	3	-	-	-	-
CO4	3	3	3	3	3	3	3	1	3	-	2	3
CO5	-	3	3	3	3	2	1	2	3	-	3	3
CO6	3	3	3	3	3	3	1	1	3	-	3	3

Module No	**Contents of the Module**	**Hours**	**COs**
1	**Introduction** Introduction to Embedded Systems- Philosophy, Embedded Systems, Embedded Design and Development Process – Applications – Microcontroller - Microprocessor - Von-Neumann and Harvard Architecture – RISC & CISC - 8051 Block diagram-Pin Diagram- Internal Data Memory - Addressing Modes- External Memory Access.	09	**CO1 CO2**
2	**Assembly Language Programming** Introduction to 8051 assembly programming, Instruction set: Data Transfer, Arithmetic and Logical Instructions, Branching and Looping Instructions- Programming	09	**CO2 CO3**

3	**Embedded C Programming** Introduction to Embedded C Programming – Timer/Counter Registers-Modes of operation-Timer/Counter Programming-Basics of serial communication- Serial Communication Registers-Programming-Types of Interrupts - Programming	09	**CO2** **CO3**
4	**Microcontroller Interfacing** Input Device Interfacing- Output Device Interfacing - Communication Interfacing - 8255 Programmable Peripheral Interface -Programming	09	**CO6**
5	**ATMEGA2560 Microcontroller** Block/Pin Diagram – Introduction to Arduino IDE- Ardunio Programming	09	**CO5** **CO6**

Text Books:

1. The8051MicrocontrollerandEmbeddedSystems–usingassemblyandC,MuhammadAli Mazidi,JaniceGillespieMazidi,RollinD.McKinlay,2ndEdition,2013,PearsonEducation
2. The8051Microcontroller&EmbeddedSystemsUsingAssemblyandCwithCD,Kenneth Ayala, 1stEdition,2010,CengageIndia
3. ProfessionalEmbeddedARMDevelopment,2nd edition,2014,JohnWiley&Sons.

Reference Books:

1. MicroprocessorsPrinciplesandApplications,AjitPal,30August2011,TataMcGrawHill
2. Microprocessors and interfacing:Programming and Hardware, Douglas V. Hall, Second Edition2006,McGrawHillInc
3. 8051Microcontroller:An Application Based Introduction, David Calcutt, Fred Hassan, Newness,2008.
4. The 8051 Microcontroller, Dr. K. UmaRaoandDr.AndhePallavi, Sanguine, 2012, Reed ElsevierIndiaPvt.Ltd
5. Atmel ATmega2560 Datasheet, 2549Q-AVR-02/2014

Assessment Pattern:

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	**Test**	**Assignment**	**Quiz**	**Curricular/Co-Curricular Activities**
Marks (Out of 50 Marks)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	-	-	2	-
Understand	5	-	1	-
Apply	5	5	-	-
Analyze	-	-	1	-
Evaluate	5	-	1	-

Create	10	5	-	10

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	**Test Marks (Out of 50 marks)**
Remember	5
Understand	5
Apply	10
Analyze	10
Evaluate	10
Create	10

DC MACHINES AND TRANSFORMERS

Course Code : 19EEE45 **Credits : 03**

L: T: P : 3:0:0 **CIE Marks : 50**

Exam Hours : 03 **SEE Marks : 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Interpret the working principle and performance of DC Machines and analyze the effect of armature reaction and process of commutation in DC machines.
CO2	Identify a suitable DC machine along with starting and speed control techniques for various industrial applications.
CO3	Familiarize the constructional details and evaluate the performance of Transformer by conducting various tests.
CO4	Analyze the different configuration and phase conversion of three-phase transformer.
CO5	Interpret the construction details, principle of autotransformer and tap changing transformers.
CO6	Analyze the parallel operation and Identify the distinct types of transformer used in various industrial applications.

Mapping of Course Outcomes to Program Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	2	2	2	1	1	2	2	1	1
CO2	3	3	2	2	2	2	1	1	2	2	1	1
CO3	3	3	2	2	2	1	1	1	2	2	1	1
CO4	3	3	2	2	2	1	1	1	2	2	1	1
CO5	3	3	2	2	2	1	1	1	2	2	1	1
CO6	3	3	2	2	2	2	1	1	2	2	1	1

Module No	Contents of the Module	Hours	COs
1	**DC Generator** Construction, principle of operation, Emf equation, types of armature windings, types of generator, armature reaction, commutation, characteristics, losses and efficiency	09	CO1
2	**DC Motor** Principle of operation, significance of back Emf, types of motor, torque equation, characteristics, speed control, starters and testing	09	CO1 CO2
3	**Single Phase Transformers** Principle of operation, types, EMF equation, transformer on no-load and load - phasor diagram, Equivalent circuit, efficiency, regulation and testing	09	CO3
4	**Three Phase Transformers** Construction- Configurations- Scott Connection, Auto transformers and tap changers.	09	CO4 CO5
5	**Parallel Operation** Load Sharing in transformers- Inrush current, Special Types of Transformers.	09	CO6

Text Books:

1. Electric Machines , Nagrath I. J and Kothari D. P, Tata McGraw Hill Publishing Company Ltd,4th edition, 2011.
2. Electrical Machinery, P.S. Bimbhra, Khanna Publishers, 7th edition, 2014.
3. Electrical Machines, AbhijitChakrabarthi, McGraw Hill Publications, 1st edition, 2015.
4. Electrical Machinery, Jr. Fitzgerald A. E.

Reference Books:

1. Principles of Electrical Machines and power Electronics, P.C.Sen, 2nd edition, 2013.
2. Electrical Machines, M.V.Deshpande, PHI Learning,2013.
3. A Text book of Electrical Machines, K.R.Siddapura&D.B.Raval, Vikas publishing house, 1st edition, 2014.
4. Fundamentals of Electric Machines, B R Gupta, New Age Publishers 3rd Edition, Reprint 2015.

Assessment Pattern:

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	Test	Assignment	Quiz	Curricular/Co-Curricular Activities
Marks (Out of 50 Marks)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	2	-	-	-
Understand	5	-	-	-
Apply	8	4	2	10

Analyze	7	4	2	-
Evaluate	3	2	1	-
Create	-	-	-	-

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	**Test Marks (Out of 50 Marks)**
Remember	6
Understand	13
Apply	14
Analyze	10
Evaluate	7
Create	-

LINEAR INTEGRATED CIRCUITS

Course Code : 19EEE46 | **Credits : 03**
L: T: P : 3:0:0: | **CIE Marks : 50**
Exam Hours : 03 | **SEE Marks : 50**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Explore the basic operational amplifier applications
CO2	Design waveform generators, comparators and signal converters
CO3	Analyze signal processing circuits and data converters
CO4	Design filter circuits and voltage regulators
CO5	Investigate PLL and design multivibrator circuits using 555 timer
CO6	Choose appropriate integrated circuit for engineering applications

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	1	1	-	-	1	1	1
CO2	3	3	2	2	2	1	1	-	-	1	1	1
CO3	3	3	2	2	2	1	1	-	-	1	1	1
CO4	3	3	2	2	2	1	1	-	-	1	1	1
CO5	3	3	2	2	2	1	1	-	-	1	1	1
CO6	3	3	3	3	1	1	1	-	1	1	2	1

Module No	Module Contents	Hours	COs

1	**Operational amplifiers:** Introduction, Block diagram representation of a typical Op-amp, schematic symbol, characteristics of an Op-amp, ideal op-amp, equivalent circuit, ideal voltage transfer curve, open loop configuration, differential amplifier, inverting & non –inverting amplifier, Op-amp with negative feedback(excluding derivations). **General Linear Applications:** A.C. amplifier, summing, scaling & averaging amplifier, inverting and non-inverting configuration, Instrumentation amplifier.	09	CO1
2	**Signal generators:** Triangular / rectangular wave generator, phase shift oscillator, saw tooth oscillator. **Comparators & Converters:** Basic comparator, zero crossing detector, inverting & non-inverting Schmitt trigger circuit, voltage to current converter with grounded load, current to voltage converter and basics of voltage to frequency and frequency to voltage converters.	09	CO2
3	**Signal processing circuits:** Precision half wave & full wave rectifiers **A/D & D/A Converters:** Basics, R–2R D/A Converter, Integrated circuit 8-bit D/A, successive approximation ADC, linear ramp ADC	09	CO3
4	**Active Filters:** First & Second order high pass & low pass Butterworth filters. Band pass filters, all pass filters. **DC Voltage Regulators:** voltage regulator basics, voltage follower regulator, adjustable output regulator, LM317 & LM337 Integrated circuits regulators.	09	CO4
5	**Phase Locked Loop (PLL):** Basic PLL, components, performance factors. **Timer:** Internal architecture of 555 timer, Mono stable multivibrators and applications	09	CO5

Text Books:

1. Operational amplifiers and linear IC's, Ramakanth A Gayakwad, PHI, 4th edition,2015.
2. Operational amplifiers and linear IC's, David A Bell, Oxford University Press, 2014

Reference Books:

1. Op Amps and Linear Integrated Circuits-Concepts and Applications, James M.Fiore,CengageLearing,2014.
2. Op Amps, Design, Applications and Trouble Shooting,Elsevier,2nd Edition,2015.
3. Operational amplifiers and linear IC's, Stanley William D, - 4th Edition, Pearson Education,2014.

4.Linear Integrated Circuits- Analysis, Design and Applications, B.Somanathan Nair, Wiley India, First Edition, 2015.

Assessment Pattern:

CIE-Continuous Internal Evaluation (50 Marks):

Bloom's Taxonomy	**Test**	**Assignment**	**Quiz**	**Curricular/Co-Curricular Activities**
Marks (Out of 50 Marks)	**25 Marks**	**10 Marks**	**5 Marks**	**10 Marks**
Remember	8	2	1	-
Understand	5	3	2	-
Apply	5	3	2	10
Analyze	5	1	-	-
Evaluate	2	1	-	-
Create	-	-	-	-

SEE – Semester End Examination (50 Marks):

Bloom's Taxonomy	**Test Marks (Out of 50 Marks)**
Remember	10
Understand	10
Apply	15
Analyze	10
Evaluate	5
Create	-

MICROCONTROLLER AND EMBEDDED SYSTEM LABORATORY

Course Code : 19EEL47 **Credits: 1.5**

L: T: P : 0:0:1.5 **CIE Marks : 25**

Exam Hours : 03 **SEE Marks : 25**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Develop an assembly language program for basic operations on the memories
CO2	Develop an assembly language program for data processing
CO3	Develop an embedded C program to interface the microcontroller to an external world
CO4	Develop an embedded system for control applications

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	3	-	-	-	-	-	-	-	-	-	3
CO2	3	1	1	2	3	-	-	-	1	1	-	-
CO3	-	-	3	-	3	3	3	3	-	-	-	-
CO4	3	3	3	3	3	3	3	1	3	-	2	3

S. No	LIST OF EXPERIMENTS	COs
1	Data transfer – Program for block data movement, sorting, exchanging, finding largest element in an array	CO1
2	Arithmetic instructions: Addition, subtraction, multiplication and division. Square and cube operations for 16-bit numbers.	CO1 CO2
3	Counters, Boolean and logical instructions (bit manipulation)	CO1 CO2
4	Conditional call and return instructions	CO4
5	Code conversion programs – BCD to ASCII, ASCII to BCD, ASCII to decimal, Decimal to ASCII, Hexa decimal to and Decimal to Hexa	CO1 CO2
6	Programs for delay andcounter operations	CO4
7	Programs using serial port and on-chip timer	CO4
8	8051 Interfacing: Stepper Motor, DC motor	CO3 CO4
9	8051 Interfacing: LCD	CO3 CO4
10	8051 Interfacing: DAC (waveform generation)	CO3 CO4

11	AVR ATMEGA2560 Interface: 4 X 4 Dot Matrix Keypad, Voltage sensor, Current Sensor, Temperature sensor, :IR sensor, PIR sensor, Ultrasonic sensor, Soil moisture sensor, Gas sensor.	CO3 CO4
12	AVR ATMEGA2560 Interface: Seven Segment, Relay, Opto-coupler with power switch drivers. Servo Motor, RS232, RF transceiver, ZigBee module.	CO3 CO4

Assessment Pattern:

CIE-Continuous Internal Evaluation Lab (25 Marks):

Blooms levels	**CIE –LAB (25 Marks)**	
	Assessment on Performance (10 Marks)	**Internal Lab Examination (15 Marks)**
Remember	-	-
Understand	1	1
Apply	5	10
Analyze	3	-
Evaluate	1	4
Create	-	-

SEE – Semester End Examination lab (25 Marks):

Bloom's Taxonomy	**External Lab Examination (25 Marks)**
Remember	-
Understand	5
Apply	10
Analyze	10
Evaluate	-
Create	-

DC MACHINES AND TRANSFORMERS LABORATORY

Course Code : 19EEL48 | **Credits : 1.5**
L: T: P : 0:0:1.5 | **CIE Marks : 25**
Exam Hours : 03 | **SEE Marks : 25**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Develop the winding diagram for DC machines using AutoCAD.
CO2	Estimate the performance of a DC machines by conducting various tests.
CO3	Examine the operation of Scott connection with two single-phase transformers.
CO4	Evaluate the performance of Transformers by conducting various tests and load sharing

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	1	1	-	1	1	1	1
CO2	3	3	2	2	-	1	1	-	1	1	1	1
CO3	3	3	2	2	-	1	1	-	1	1	1	1
CO4	3	3	2	2	-	1	1	-	1	1	1	1

S. No	LIST OF EXPERIMENTS	COs
1	Develop a winding diagram for DC machines in AutoCAD	CO1
2	Speed Control of DC shunt motor by armature voltage control and flux control methods	CO2
3	Brake test on a DC shunt motor –Determination of speed –torque and efficiency characteristics	CO2
4	Retardation Test on DC shunt machine	CO2
5	Fields test on series motor	CO2
6	Determination of magnetisation, internal & load characteristics of DC shunt generator.	CO2
7	Swinburne's Test on DC shunt machine	CO2

8	Calculation of efficiency and regulation by open circuit and short circuit test on single phase transformer	CO4
9	Polarity Test and connection of three single phase transformer in star-Delta	CO4
10	Sumner's test on similar transformer and determination of combined and individual transformer.	CO4
11	Scott connection with balanced and unbalanced resistive loads	CO3
12	Parallel operation of two dissimilar single phase transformer	CO4

Assessment Pattern:

CIE-Continuous Internal Evaluation Lab (25 Marks):

Blooms levels	**CIE –LAB (25 Marks)**	
	Assessment on Performance (10 Marks)	**Internal Lab Examination (15 Marks)**
Remember	-	-
Understand	1	2
Apply	2	3
Analyze	3	4
Evaluate	4	6
Create	-	-

SEE – Semester End Examination Lab (25 Marks):

Bloom's Taxonomy	**External Lab Examination (25 Marks)**
Remember	-
Understand	3
Apply	6
Analyze	6
Evaluate	10
Create	-

BASIC APPLIED MATHEMATICS-II

Course Code : 19DMAT41 **Credits : 00**
L:T:P : 0:0:0 **CIE Marks : 25**
Exam Hours : 02 **SEE Marks : 25**

Course Outcomes: At the end of the Course, the Student will be able to do the following:

CO1	Gain knowledge of basic operations of vectors
CO2	Use curl and divergence of a vector function in three dimensions
CO3	Develop the ability to solve higher order Linear differential equations
CO4	Understand basic concepts of Laplace transform to solve the Periodic and Step functions and also solve initial and boundary value problems using Laplace transform method

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	2	-	-	-	1	3	-	1
CO2	3	2	3	2	2	-	-	-	1	3	-	1
CO3	3	2	3	2	2	-	-	-	1	3	-	1
CO4	3	2	3	2	2	-	-	-	1	3	-	1

Course Syllabus

Module No.	Contents of the Module	Hours	CO's
1.	**Vectors:** Definition of scalar and vector, Vector addition, Subtraction and Multiplication-Dot product, Cross product, Scalar triple product. Orthogonal, Co-planar and Angle between vectors-Problems.	**5L**	**CO1**
2.	**Vector Differentiation:** Velocity and Accelerations,Vector differential operator-Gradient of a scalar function, Divergence of a vector function, Curl of a vector function-Problems. Solenoidal and irrotational vector fields-Problems.	**5L**	**CO2**
3.	**Linear differential equations with constant coefficients:** Solution of initial and boundary value problems, Inverse differential operator techniques for the functions-e^{ax}, $Sin\ (ax+b)$ and $\mathrm{Cos}\ (\mathrm{ax}+\mathrm{b})$.	**5L**	**CO3**
4.	**Laplace Transform:** Definition and Laplace transforms of elementary functions-Problems. Properties of Laplace transforms (without proof) ,Periodic functions(without proof), Heaviside function(without proof) -Problems.	**5L**	**CO4**

5.	**Inverse Laplace Transform:** Inverse Laplace Transform by partial fractions, completing the square method-Problems. Solution of linear differential equations using Laplace Transforms-Problems.	**5L**	**CO4**

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, Wiley-India Publishers, 10th Edition, 2014, ISBN: 978-81-265-5423-2.
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43rd Edition, 2014, ISBN: 978-81-7409-195-5.

Reference Books:

1. Glyn James, Modern Engineering Mathematics, Prentice Hall, 4th Edition, 2015, ISBN: 978-0-273-73409-3
2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education (India) Private Limited, 4th Edition, 2016, ISBN: 978-0-07-063419-0.
3. H. K. Dass, Advanced Engineering Mathematics, S. Chand & Company Ltd., 28th Edition, 2012, ISBN: 81-219-0345-9.
4. N.P.Bali and Manish Goyal, A Text Book of Engineering Mathematics, Laxmi Publications (P) Ltd., 9th Edition, 2014, ISBN: 978-81-318-0832-0.

Assessment Pattern:

1. CIE- Continuous Internal Evaluation (25 Marks)

Bloom's Category	Tests (20 Marks)	Assignment (5 Marks)
Remember	5	-
Understand	5	5
Apply	5	-
Analyze	2.5	-
Evaluate	2.5	-
Create	-	-

2. SEE- Semester End Examination (25 Marks)

Bloom's Category	Questions (25 Marks)
Remember	5
Understand	10
Apply	5
Analyze	2.5
Evaluate	2.5
Create	-

ECONOMICS FOR ENGINEERS

Course Code	**:**	**HSS321/421**	**Credits**	**:**	**03**
L:T:P	**:**	**3:0:0**	**CIE**	**:**	**25**
ExamHour	**:**	**03 Hrs.**	**SEE**	**:**	**25**

Course Outcomes: On completion of the course, the student will be able to:

CO1	Gain knowledge about importance of economics in decision making processes in a dayto day life.
CO2	Analyze business environment at micro and macroeconomic level and its Impact on industries in country's economy.
CO3	Acquire knowledge about costing and estimation of projects for profit making.
CO4	Apply principles of budgeting and finance for entrepreneurial success.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	-	1	-	2	2	2	1	2	2
CO2	2	2	1	-	1	-	2	2	2	1	2	2
CO3	2	2	1	-	1	-	2	2	2	1	2	2
CO4	2	2	1	-	1	-	2	2	2	1	2	2

Module No.	Contents of Module	Hours	Cos
1	**Introduction to Economics:** Role of Engineer as an Economist, Types and problem of economies, Basics of economics(GDP,Nationalincome,inflation,businesscycle,fiscal and monetary policies, balance of payment).	6	CO1,CO3
2	**Basic concepts of Microeconomics:** Concept of Demand & Elasticity of Demand. Concept of Supply & Elasticity of Supply, Meaning of Production and factors of production, ProductionPossibilityCurve,Lawofvariableproportionsand returns to scale. Relevance of Depreciationtowards industry,Depreciation computing methods.	6	CO2,CO3
3	**Concepts of cost of production:** Different types of cost; accounting cost, sunk cost, marginal cost and opportunity cost. Break even analysis, Make or Buy decision. Cost estimation,ElementsofcostasDirectMaterialCosts,Direct LaborCosts,FixedOver-Heads,Factorycost,Administrative Over-	6	CO3,CO4

	Heads.		
4	**Capital budgeting:** Traditional and modern methods, Payback period method, IRR, ARR, NPV, PI. . Interest and Interest factors: Interest rate, Simple interest, Compound interest, Cash - flow diagrams, Personal loans and EMI Payment. Present worth, Future worth.	6	CO1,CO3,CO 4,
5	**Book Keeping and Accounts:** Journal, Ledger, Trial balance, asset Types, profit & loss account, balance sheet.	6	CO1,CO2,CO 3,CO4

TEXT BOOKS:

1.RiggsJ.L,EngineeringEconomy,TMH,2012edition
2.JainT.R.,EconomicsforEngineers,VKPublications,2008 Editio
3.IMPANDEY,FinacialManagement,VikasPub.House, 2018 Edition
4.DNDwivedi,MangerialEconomics,VikasPub.House, 2018 Edition
5.Dr.A.R Sainath,SasikalaDevi,Engineering Economics and Financial Accounting,Charulatha Publications,2015 edition

REFERENCE BOOKS:

1. Thuesen H.G, Engineering Economy.PHI,1984

2.Prasanna Chandra, FinancialMangement,TMH,2007
3.Singh Seema, Economics for Engineers, IKInternational,2014
4. Chopra P. N, Principle of Economics, KalyaniPublishers,2012
5. Dewett K K, Modern Economic Theory, S.Chand,2006

Assessment pattern:

CIE - Continuous Internal Evaluation (25 Marks):

Bloom's Category	Test	Assignment	SSR
Marks (out of 50)	**10**	**7.5**	**7.5**
Remember	2.5	-	-
Understand	2.5	-	-
Apply	2.5	-	-
Analyze	2.5	2.5	2.5
Evaluate	-	2.5	2.5
Create	-	2.5	2.5

SEE – Semester Ending Examination (25 Marks):

Bloom's Category	SEE Theory (25)
Remember	10
Understand	5
Apply	5
Analyze	5
Evaluate	-
Create	-

LIFE SKILLS FOR ENGINEERS

Course Code	**: 19HSS322/422**	**Credits**	**: 03**
L: T:P	**: 3:0:0**	**CIE Marks**	**: 50**
Exam Hours	**: 3**	**SEE Marks**	**: 50**

Course Outcomes: At the end of the course, the student will be able to:

CO1	Set personal and professional goals
CO2	Practice critical thinking and creative thinking
CO3	Develop a sense of responsibility and accountability
CO4	Apply the concepts of personality development and grooming in real life
CO5	Understand self and work with groups
CO6	Articulate and convey their ideas and thoughts with clarity and focus

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	-	3	3	3	2	3
CO2	-	-	-	-	-	2	-	3	3	3	2	3
CO3	-	-	-	-	-	2	-	3	3	3	2	3
CO4	-	-	-	-	-	2	-	3	3	3	2	3
CO5	-	-	-	-	-	2	-	3	3	3	2	3
CO6	-	-	-	-	-	2	-	3	3	3	2	3

Module No.	Module Contents	Hours	COs
1	Goal Setting: Importance of Goals: Creating SMART goals; Critical Thinking and Problem Solving, Six Thinking Hats, Multiple Intelligences and Mind Mapping	6	CO1, CO2
2	Taking Ownership, Being Responsible and Accountable. Meaning of Ownership, Responsibility and Accountability, Practicing these philosophies in course, career and life, Developing a 'Credible Character Impression about self', Self-Motivation, Developing healthy Self-esteem, Leadership	8	CO3
3	Personality Development and Grooming: Expectations from the industry, building personal presence, corporate grooming, corporate	6	CO4

	etiquettes, Personal branding and image management		
4	Self-Awareness and Self-Management: Emotional Intelligence, Knowing your own self- understanding personality, perception, values and attitude. Interpersonal skills - Knowing others, working well with others, developing the right attitude for work, being proactive and positive.	8	CO5
5	Articulation and Group Discussion: Ideas generation, expressing thoughts in a logical flow, presenting views in a group	8	CO6

REFERENCE BOOKS:

1. The 7 – Habits of Highly Effective People, Stephen R Covey, Neha Publishers.
2. Seven Habits of Highly Effective Teens, Convey Sean, New York, Fireside Publishers, 1998.
3. Emotional Intelligence, Daniel Coleman, Bantam Book, 2006.
4. How to win friends and influence people Dale Carnegie

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Tests	Assignments	Self Study	Peer Evaluation
Marks (out of 50)	**10**	**15**	**15**	**10**
Remember	-	-	-	-
Understand	-	-	-	-
Apply	5	5	-	5
Analyze	-	-	5	-
Evaluate	-	-	-	-
Create	5	10	10	5

SEE- Semester End Examination (50 Marks)

NOTE: Being a Life skills course we felt it would be suitable to do the final assessment through a structured group discussion which will provide an opportunity to test students in all levels of Bloom's Taxonomy.

Bloom's Category	Group Discussion
Remember	5
Understand	10
Apply	10
Analyse	10
Evaluate	5
Create	10

ENVIRONMENTAL SCIENCE AND AWARENESS

Course Code : 19HSS 323/423 | **Credits : 0**
L : T : P : 0:0:0 | **CIE Marks : 25**
Exam Hours : 02 Hrs | **SEE Marks : 25**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Understand the concepts of environment, ecosystem, biodiversity and its interdependence on human life.
CO2	Develop an insight on types of natural resources and the concept of sustainable development.
CO3	Understand the different control measures of pollution and importance of waste management.
CO4	Think and apply technology as a solution for environment related concerns, keeping in view the different environmental acts and amendments.

Mapping of Course Outcomes to Program Outcomes:

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

Module No.	Content of Module	Hrs	COs
1	**Introduction to Environment, Ecosystem and biodiversity:** Environment - Components of Environment, Scope and importance of Environmental studies, Ecosystem: Types & Structure of Ecosystem, Energy flow in the ecosystem, Food chains – food webs & ecological pyramids. Biodiversity – Definition, Hot-spots of biodiversity, Threats to biodiversity, Conservation of biodiversity.	05	CO1
2	**Natural Resources:** Renewable and non-renewable resources – Natural resources and associated problems. Role of an individual in conservation of natural resources. Water conservation, rain water harvesting. Balanced use of resources for sustainable lifestyle – strategies.	04	CO2
3	**Environmental Pollution:** Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise pollution, Thermal Pollution and Nuclear hazards. Role of an individual in prevention of pollution - Waste management – urban and industrial wastes.	04	CO3

4	**Social Issues and Environment:** Environmental ethics – issues and possible solutions. Environment protection act – Air (prevention and Control of pollution) act & Water (prevention and Control of pollution) act. Role of government: Swatch Bharat Abhiyan, National Mission for Clean Ganga (NMCG), River rejuvenation, Role of Non-governmental Organizations (NGOs), Global warming and climate change.	04	CO3 CO4
5	**Human Population and Environment:** Population growth & explosion, Family welfare programme. Environment and human health, Human rights, Value education. Role of Technology in protecting environment and human health.	05	CO4

Text Books:

1. Environmental Studies: Basic Concepts,Ahluwalia, V. K. . The Energy and Resources Institute (TERI) Publication, 2nd edition, 2016. ISBN: 817993571X, 9788179935712.
2. Textbook of Environmental Studies for Undergraduate Courses of all branches of Higher Education,Bharucha, Erach for UGC, New Delhi, 2004. ISBN: 8173715408, 9788173715402.

Reference Books:

1. Handbook of Environmental Engineering by RaoSurampalli, Tian C. Zhang, SatinderKaurBrar, KrishnamoorthyHegde, Rama Pulicharla, MausamVerma; McGraw Hill Professional, 2018. ISBN: 125986023X, 9781259860232
2. Environmental Science and Engineering by P. Venugopala, Prentice Hall of India Pvt. Ltd, New Delhi, 2012 Edition. ISBN: 978-81-203-2893-8.
3. Environmental Science- Working with the earth by G Taylor Miller Jr, Brooks Cole Thompson Publications, 10 thEdition. ISBN: 10: 0534424082.
4. Elements of Environmental Science and Engineering by P. Meenakshi, Prentice Hall of India Pvt. Ltd, 2005 Edition. ISBN: 8120327748, 9788120327740.

Assessment Pattern:

CIE- Continuous Internal Evaluation (25 Marks):

Bloom's Category	**Tests**	**Assignments**	**Quiz**
Marks (out of 25)	**15**	**05**	**05**
Remember	5	2	2
Understand	5	2	2
Apply	5	1	1
Analyze	0	0	0
Evaluate	0	0	0
Create	0	0	0

SEE – Semester End Examination (25 Marks):

Bloom's Category	Tests
Remember	10
Understand	10
Apply	5
Analyze	0
Evaluate	0
Create	0

VYAVAHARIKA KANNADA (KANNADA FOR USE)

Course Code : 20HSS 325/425 | **Credits : 01**
L : T : P : 1:0:0 | **CIE Marks : 25**
Exam Hours : 02 Hrs | **SEE Marks : 25**

Course Outcomes: At the end of the Course, the student will be able to:

CO1	Understand Kannada Language.
CO2	Communicate in Kannada Language
CO3	Read simple Kannada words
CO4	Pronounce Kannada words correctly

Mapping of Course Outcomes to Program Outcomes:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-

Module No.	Content of Module	Hrs	COs
1	Chapter – 1: Vyavaharika Kannada – Parichaya (Introducton to Vyavaharika Kannada)	05	CO1 CO2 CO3 CO4
2	Chapter – 2: Kannada Aksharamale haagu uchharane (Kannada Alphabets and Pronunciation)	04	
3	Chapter – 3: Sambhashanegaagi Kananda Padagalu (Kannada Vocabulary for Communication)	04	
4	Chapter – 4: Kannada in Conversations (Sambhashaneyalli Kannada)	04	
5	Chapter – 5: Activities in Kannada. (Kannada Sambhashanegaagi Chatuvatikegalu)	05	

Text Books:

1. Vyavaharika Kannada by Dr. L. Thimmesh, Prof. V. Keshavamurthy, published by: VTU, Belagavi

Assessment Pattern:

CIE- Continuous Internal Evaluation and SEE – Semester End Examination (25 Marks):

Bloom's Category	CIE(25M)	SEE(25M)
Remember	12	12
Understand	13	13
Apply	-	-
Analyze	-	-

Evaluate	-	-
Create	-	-

ಆಡಳಿತ ಕನ್ನಡ

(KANNADA FOR ADMINISTRATION)

Course Code: 20HSS324/424 **Credits : 01**

L: T: P : 1:0:0 **CIE Marks : 25**

Exam Hours : 2 **SEE Marks : 25**

ಆಡಳಿತ ಕನ್ನಡ ಅಧ್ಯಯನದ ಕಾಳಿಕಾಂಶಗಳು

CO1 ವಿದ್ಯಾರ್ಥಿಗಳು ಕನ್ನಡ ವ್ಯಾಕರಣದ ಬಗ್ಗೆ ಹಗೂ ಬಾಷಾ ರಚನೆ ನಿಯಮಗಳನ್ನು ಅರ್ಥತಿಸಿಕೊಳ್ಳುತಾರೆ

CO2 ವ್ಯಾಕರಣದ ಬಾಷಾ ಬರಹದಲ್ಲಿನ ದೋಷಗಳು, ನಿವಾರಣೆ ಮತ್ತು ಲೇಖನ ಚಿಹ್ನೆಗಳನ್ನು ಅರಿತುಕೊಳ್ಳುವರು

CO3 ಸರ್ಕಾರಿ ಮತ್ತು ಅರೆ ಸರ್ಕಾರಿ ಪತ್ರ ವ್ಯವಹಾರದ ಬಗ್ಗೆ ತಿಳುವಳಿಕೆ ಪಡೆಯುವರು

CO4 ಭಾಷಾಂತರ ಮತ್ತು ಪ್ರಬಂಧ ರಚನೆ ಬಗ್ಗೆ ಆಸಕ್ತಿ ವಹಿಸಿಕೊಳ್ಳುವವರೂ

CO- PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	3	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-

ಪರಿವಿಡಿ (ಪಠ್ಯ ಪುಸ್ತಕದಲ್ಲಿರುವ ವಿಷಯಗಳ ಪಟ್ಟಿ)

ಅದ್ಯಾಯ - 1 ಕನ್ನಡ ಬಾಷಾ-ಸಂಕ್ಷಿಪ್ತ ವಿವರಣೆ

ಅದ್ಯಾಯ - 2 ಬಾಷಾ ಪ್ರಯೋಗದಲ್ಲಾಗುವ ಲೋಪದೋಷಗಳು ಮತ್ತು ಅವುಗಳ ನಿವಾರಣೆ

ಅದ್ಯಾಯ - 3 ಲೇಖನ ಚಿನ್ನೆಗಳು ಮತ್ತು ಅವುಗಳ ಉಪಯೋಗ

ಅದ್ಯಾಯ - 4 ಪತ್ರ ವ್ಯವಹಾರ

ಅದ್ಯಾಯ - 5 ಆಡಳಿತ ಪತ್ರಗಳು

ಅದ್ಯಾಯ - 6 ಸರ್ಕಾರದ ಆದೇಶ ಪತ್ರಗಳು

ಅದ್ಯಾಯ - 7 ಸಂಕ್ಷಿಪ್ತ ಪ್ರಬಂಧ ರಚನೆ (ಪ್ರಿಸೈಸ್ ರೈಟಿಂಗ್), ಪ್ರಬಂಧ ಮತ್ತು ಬಾಷಾಂತರ

ಅದ್ಯಾಯ - 8 ಕನ್ನಡ ಶಬ್ದ ಸಂಗ್ರಹ

ಅದ್ಯಾಯ - 9 ಕಂಪ್ಯೂಟರ್ ಹಾಗೂ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ

ಅದ್ಯಾಯ - 10 ಪಾರಿಭಾಷಿಕ ಆಡಳಿತ ಕನ್ನಡ ಪದಗಳ ಮತ್ತು ತಾಂತ್ರಿಕ / ಕಂಪ್ಯೂಟರ್ ಪಾರಿಭಾಷಿಕ ಪದಗಳು

ಆಡಳಿತ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕ ಲೇಖಕರು

ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ, ಪ್ರೊ. ವಿ . ಕೇಶವಮೂರ್ತಿ, ಪ್ರಕಟಣೆ: ಪ್ರಸಾರಾಂಗ, ವಿ .ತಾ. ವಿ. ಬೆಳಗಾವಿ

ಪರೀಕ್ಷೆಯ ವಿಧಾನ :

ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ (Continuous Internal Evaluation) : 25 ಅಂಕಗಳು

ಸೆಮಿಸ್ಟರ್ ಪರೀಕ್ಷೆ (Semester End Examination) : 25 ಅಂಕಗಳು

Blooms Category	CIE(25)	SEE(25)
Remember	12	13
Understand	13	12

APPENDIX A

Outcome Based Education

Outcome-based education (OBE) is an educational theory that bases each part of aneducational system around goals (outcomes). By the end of the educational experience each student should have achieved the goal. There is no specified style of teaching or assessment in OBE; instead classes, opportunities, and assessments should all help students achieve the specified outcomes.

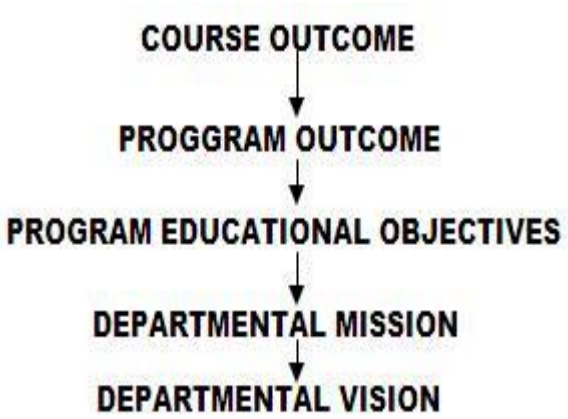
There are three educational Outcomes as defined by the National Board of Accreditation:

Program Educational Objectives: The Educational objectives of an engineering degreeprogram are the statements that describe the expected achievements of graduate in their career and also in particular what the graduates are expected to perform and achieve during the first few years after graduation. [nbaindia.org]

Program Outcomes: What the student would demonstrate upon graduation. Graduateattributes are separately listed in Appendix C

Course Outcome: The specific outcome/s of each course/subject that is a part of theprogram curriculum. Each subject/course is expected to have a set of Course Outcomes

Mapping of Outcomes



APPENDIX B

The Graduate Attributes of NBA

Engineering knowledge: Apply the knowledge of mathematics, science, engineeringfundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, research literature, and analyze complex engineeringproblems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems anddesign system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: The problems that cannot be solved bystraightforward application of knowledge, theories and techniques applicable to the engineering discipline that may not have a unique solution. For example, a design problem can be solved in many ways and lead to multiple possible solutions that require consideration of appropriate constraints/requirements not explicitly given in the problem statement (like: cost, power requirement, durability, product life, etc.) which need to be defined (modeled) within appropriate mathematical framework that often require use of modern computational concepts and tools.

Modern tool usage: Create, select, and apply appropriate techniques, resources, andmodern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineeringsolutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities andnorms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leaderin diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with theengineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of theengineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage inindependent and life-long learning in the broadest context of technological change.

APPENDIX C

BLOOM'S TAXONOMY

Bloom's taxonomy is a classification system used to define and distinguish differentlevels of human cognition—i.e., thinking, learning, and understanding. Educators have typically used Bloom's taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies.