### Department of Electrical & Electronics Engineering
### Scheme of Teaching and Examination
### B.E. (E&E) III SEMESTER
### (Academic Year 2013-14)

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Subject Code</th>
<th>Subject</th>
<th>C</th>
<th>Hours/Week</th>
<th>Examination Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>UMA301C</td>
<td>Engineering Mathematics – III</td>
<td>4</td>
<td>L 4 T 4</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>02</td>
<td>UEE312C</td>
<td>Analog Electronics</td>
<td>4</td>
<td>L 4 T 4</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>03</td>
<td>UEE313C</td>
<td>Digital Electronics</td>
<td>4</td>
<td>L 4 T 4</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>04</td>
<td>UEE314C</td>
<td>Network Analysis</td>
<td>4</td>
<td>L 4 T 4</td>
<td>CIE 50 SEE 50 Total 100</td>
</tr>
<tr>
<td>05</td>
<td>UEE315C</td>
<td>Electrical &amp; Electronics Measures</td>
<td>4</td>
<td>L 4 T 4</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>06</td>
<td>UHS316C</td>
<td>Intellectual Property Rights</td>
<td>3</td>
<td>L 3 T 3</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>07</td>
<td>UEE317L</td>
<td>Digital Electronics Lab</td>
<td>1.5</td>
<td>L 1.5 T 03</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>08</td>
<td>UEE318L</td>
<td>Circuit Simulation &amp; Measurements Lab</td>
<td>1.5</td>
<td>L 1.5 T 03</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td>09</td>
<td>UBT133M</td>
<td>Environmental Studies</td>
<td>--</td>
<td>L -- T 2</td>
<td>CIE 50 SEE 50 Total 100</td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
<td></td>
<td>L 26 T 25 P 6</td>
<td>CIE 450 SEE 450 Total 900</td>
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</tbody>
</table>

**Environmental Studies** is a mandatory subject for lateral entry students. Question Paper will be of Objective type. Students have to pass the subject compulsorily, however marks will not be considered for awarding Grade / Class / Rank.

### Legend for Scheme
- L: Lecturer
- T: Tutorial
- P: Practical
- M: Mandatory

### Legend in Subject code
- C: Core
- E: Elective
- C: Credits
Prerequisite

Unit-I

01. NUMERICAL ANALYSIS: 14 Hours
Roots of Transcendental equations using Bisection Method, Regula-Falsi Method and Newton-Raphson Method, Finite differences, forward, backward and central difference operators (no derivations on relations between operators), Newton-Gregory forward and backward interpolation formulae. Lagrange's and Newton's divided difference interpolation formulae (without proof), Numerical differentiation using Newton's forward & backward formulae.

02. NUMERICAL INTEGRATION:
Gaussian quadrature Trapezoidal rule, Simpson's one third rule, Simpson's three eighth rule and Weddle's rule (no derivation of any formulae). Numerical solutions of first order ODE - Taylor’s series Method, Modified Euler's method, Runge-Kutta 2nd and 4th order method, Milne's Predictor and Corrector method (problems only).

Unit-II

03. FOURIER SERIES, FOURIER TRANSFORMS, Z-TRANSFORMS: 14 Hours
Periodic functions, Conditions for Fourier series expansions, Fourier series expansion of continuous functions and functions having infinite number of discontinuities, even and odd functions. Half-range series, Practical Harmonic Analysis.
Z - Transform - definition, standard forms, Linearity property, damping rule, shifting rule - problems.

Unit-III

03. PARTIAL DIFFERENTIAL EQUATIONS: 12 Hours

Unit-IV

04. LINEAR ALGEBRA: 12 Hours
Rank of a matrix by elementary row transformations, Consistency of system of linear equations, Gauss elimination method, Gauss - Seidel method, characteristic values and characteristic vectors of matrices (no theorems), Largest Eigen value and the corresponding Eigen vector by Power Method.

05. CALCULUS OF VARIATIONS:
Variation of a function and a functional, Extremal of a functional, Varational Problems, Euler's equation, Standard variation problems including geodesics, minimal surface of revolution, hanging chain and Brachistochrone problems.

Text Books:

Reference Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each
ANALOG ELECTRONICS

Subject Code: UEE312C
Credits: 04
Exam Duration: 03 Hours

Prerequisite

Unit-I

01. Diode Circuits: 07 Hours
Introduction, clipping circuits, Clipping at two independent levels, Clamping Circuits, Comparators, Full wave rectifier with C filter, Voltage doublers.

02. Transistor Biasing: 06 Hours
Introduction, Operating point, DC load line, Bias stability, Fixed bias and voltage divider bias, Derivation of stability factors, Bias compensation.

Unit-II

03. BJT Low Frequency Analysis: 09 Hours
Introduction, Graphical analysis of CE configuration, two port devices. Hybrid model, transistor hybrid model. h - Parameters, Analysis of transistor amplifier circuit using h- parameters (CEamplifier only), Miller's theorem and its dual.

04. BJT High Frequency Analysis: 04 Hours
Introduction, Hybrid π common emitter model, Hybrid π conductance, Hybrid π capacitances.

Unit-III

05. Field Effect Transistor: 04 Hours
Introduction, construction & characteristics of JFETs, transfer characteristics, important relationships, Depletion & Enhancement type MOSFETs.

06. Multistage Amplifiers: 04 Hours
Introduction, Classification of Amplifiers, distortion in amplifiers, Frequency response of an amplifier, Two stage RC coupled transistor amplifier.

07. Feedback Amplifiers: 05 Hours
Introduction, Classification, Feedback concept, Transfer gain with feedback, General characteristics of negative feedback amplifiers, Input resistance, Output resistance for voltage series, voltage shunt, current series and current shunt,

Unit - IV

08. Oscillator Circuits: 05 Hours
Introduction, Oscillator operation, Phase shift oscillator, Colpitts oscillator and Crystal oscillator using BJT.

09. Power Amplifier: 08 Hours
Introduction, Class A large signals amplifier Second harmonic distortion, Transformer coupled audio power amplifier, Class B (Push pull) amplifiers, derivation of efficiency.

Text Books :

Reference Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
DIGITAL ELECTRONICS

Subject Code: UEE313C
Credits: 04
SEE Marks: 100
Exam Duration: 03 Hours

Prerequisite

Unit - I

01. Principles of Combinational Logic: 07 Hours
Definition of combinational logic, canonical forms, generation of switching equations from truth tables. Karnaugh maps - 3 & 4 variables, incompletely specified functions (Don't Care terms), simplifying minterm and maxterm equations.

02. Minimization Techniques: 06 Hours
Quine-McClusky minimization technique, Quine-McClusky using Don't Care terms, reduced prime implicant tables, Map entered variables.

Unit – II

03. Analysis and Design of Combinational Logic: 13 Hours

Unit - III

04. Sequential Circuits 1: 07 Hours

05. Sequential Circuits 2: 06 Hours
Characteristic equations, registers, counters - binary ripple counters, synchronous binary counters, counter based on shift registers, design of synchronous counters, design of synchronous mod-6 counter using clocked D, T, JK and SR flip- flops.

Unit - IV

06. Programmable Logic Devices: 04 Hours
PLD notation, programmable read only memories (PROMs), programmable logic arrays (PLAs), programmable array logic (PAL) devices.

07. Sequential Circuit Design 1: 05 Hours
Introduction, Mealy and Moore models, state machine notation, synchronous sequential circuit analysis.

08. Sequential Circuit Design 2: 04 Hours
Construction of state diagrams, counter design.

Text Books

Reference Books

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
NETWORK ANALYSIS

Subject Code: UEE314C  SEE Marks: 100
Credits: 04  Exam Duration: 03 Hours

Prerequisite

Unit - I
01. Mesh and Node Analysis: 07 Hours
Practical source transformation, network reduction using star delta transformation, Loop and node analysis with linearly dependent and independent source for DC and AC network. Concept of super node and super mesh.

02. Network Topology: 07 Hours
Graph of network, concept of tree and co-tree, incidence matrix, Tie-set & cut-set schedules, Formulation of equilibrium equations in matrix form, solution of resistive network, principles of duality.

Unit - II
03. Network Theorems-I: 06 Hours
Superposition, Reciprocity, and Millman's theorems.

04. Network Theorems-II: 06 Hours
Thevenin's, Norton's and Maximum power transfer theorems

Unit – III
05. Resonant Circuits: 06 Hours
Series and parallel resonance, frequency-response of series and parallel circuits, Q-factor, Bandwidth.

06. Transient behavior and initial conditions: 07 Hours
Behavior of circuit element under switching condition and their representation, evaluation of initial and final conditions in RL, RC, and RLC circuits for AC and DC excitation

Unit - IV
07. Laplace Transformations and Applications: 07 Hours
Step, Ramp and Impulse functions and their Laplace transformation, Waveform synthesis and Laplace transformation initial value theorem and final value theorem, transformed network and their solution.

08. Two port network parameters: 06 Hours
Short Circuit admittance parameters, open circuit impedance parameters, transmission parameters, hybrid parameters, relationship between parameters sets.

Text Books:

Reference Books

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
ELECTRICAL AND ELECTRONIC MEASUREMENTS

Subject Code: UEE315C
Credits: 04
Exam Duration: 03 Hours

Prerequisite

01. Units and dimensions: 03 Hours
Review of fundamental and derived units, SI units and dimensional equations.

02. Measurement of Resistance, Inductance and Capacitance: 10 Hours
Wheatstone’s bridge, Sensitivity analysis, limitations; Kelvin double bridge, Maxwell’s Inductance and Capacitance Bridge, Anderson’s Bridge, De-sauty’s bridge, Megger, Schering Bridge, Sources and detectors, shielding of bridges.

03. Measurements of Power and Related Parameters: 08 Hours
Wattmeter, LPF Wattmeter, induction type energy meter - construction, theory, errors adjustments and calibration; Principle of electronic energy meter, Construction and operation of electro dynamometer type single-phase PF meter, Weston frequency meter and phase sequence indicator.

04. Electronic Instruments: 05 Hours
Introduction, True RMS responding voltmeter, Electronic multimeters, digital voltmeters and Q-meter.

05. Extension of Instrument Ranges: 08 Hours
Shunts and multipliers; construction and theory of instrument transformers, ratio and phase angle errors of CT and PT, turns compensation.

06. Fiber Optic Measurements: 05 Hours
Introduction, sources and detectors for fiber optic measurements, fiber optic power measurements, stabilized and calibrated light sources.

07. Transducers: 07 Hours
Classification, selection, strain gauges, LVDT, photoconductive and photovoltaic cells, interfacing resistive transducers to electronic circuits, Introduction to data acquisition systems.

08. Computer Controlled Test Systems: 06 Hours
Introduction, instruments used in computer controlled instrumentation, IEEE 488 electrical interfaces.

Text Books

Reference Books

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
INTELLECTUAL PROPERTY RIGHTS

Subject Code: UHS316C
Credits: 03
Prerequisite

UNIT – I

01. INTRODUCTION:
10 Hours
Concept of Property, History of IPR, Different forms of IPR, Role of IPR in R & D.

02. PATENTS:

UNIT – II

03. COPYRIGHT:
10 Hours
Introduction, What is a copy right & neighboring rights, Nature of copyright, Subject matters of copy right, Rights conferred by copy right, Copy right protection in India, Transfer of copy right, Infringement of copy right & defenses, Computer software & IPR.

04. CONFIDENTIAL INFORMATION & TRADE SECRETS:
Protection of confidential information, Ingredients of an action for breach of confidence, Distinction between confidential information & general information,

UNIT – III

05. TRADEMARKS:
10 Hours
Meaning of Trademarks, Fundamental concepts, Function of Trade marks, Terminology & Symbols, Establishing Trademark Right, Registrability & Distinctive Character, Good will, Passing off, Domain Names, Comparison with patent and Copyrights.

06. INDUSTRIAL DESIGN:
Introduction, Justification, Included Subject Matter, Excluded Subject matters, Industrial Design & Registration in India, Infringement of design and remedies for Infringement, Semiconductor topography design rights.

UNIT – IV

07. PATENT DRAFTING:
10 Hours
Scope of inventions, Definitions, Omnibus Paragraphs, Descriptions, Drawings, Claim Drafting, Industrial Design Drafting.

08. FILING REQUIREMENTS:
Forms to be submitted, Assignments requirements, Requirements under EU, US & Other countries, Filing mechanism through individual Patent office, PCT route, claiming priority from either route.

09. SEARCHING:
Prior art, Tangible v/s Intangible prior art, Search strategy Key Words, Structures, Sequences, use of operators, database for searching free an paid, disclosed v/s Claimed matter, International Search reports, Request for re-examination & revocation, terms of patent & patent renewal,

Text Books:

References Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
Prerequisite

01. Simplification, realization of Boolean expressions using logic gates /Universal gates.
02. Realization of Half/Full adders and Half/Full Subtractors using logic gates
03. (i) Realization of parallel adder/subtractors using 7483 chip
   (ii) BCD to Excess-3 code conversion and vice versa.
04. Realization of Binary to Gray Code conversion and vice versa.
05. MUX / DEMUX-use of 74153, 74139 for arithmetic circuits and code converters
06. Realization of One/Two bit comparator and study of 7485 magnitude comparator.
07. (a) Use of Decoder chip to drive LED display (b)Priority encoder.
08. Truth table verification of Flip- Flops (i) JK Master slave (ii) T type and (iii) D type
09. Realization of 3 bit counters and MOD- N counter design (7476, 7490, 74192, 74193).
10. Shift left; Shift Right; SIPO, SISO, PIPO, PISO, operations using 74S95.
11. Ring counter and Johnson counter.
12. Sequence Generator.

Laboratory Assessments for SEE:
1. Each Laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE)
2. Allocation of 50 marks for CIE Performance and journal write-up: Marks for each experiment = 30 marks / No. of proposed experiments. One Practical test for 20 marks, (5 write up, 10 conduction, calculation, results etc., 5 viva-voce).
3. Allocation of 50 marks for SEE: 25% write up, 50% conduction, calculation, results etc., 25% viva-voce.
Prerequisite

01. Measurement of low resistance using Kelvin's double bridge.
02. Measurements of inductance using Maxwell's L-C bridge & determination of Q factor.
03. Measurements of capacitance using De-sauty's bridge & determination of dissipation factor.
04. Adjustment and calibration of I-Φ Energy meter.
05. Measurement of power in a balanced 3-phase circuit using two wattmeter for star & delta connected loads.
06. Resonance characteristics for series and parallel circuits.
   (a) Conventional method and (b) using simulation package.
07. Verification of KCL & KVL for multi loop electrical circuits, with DC & AC controlled and independent source's by simulation package.
08. Verification of Thevenin's theorem by;
   (a) conventional method and (b) using simulation package.
09. Verification of Maximum Power Transfer theorem (a) Conventional method and (b) using simulation package.
10. RC coupled amplifier-frequency response for variation of bias & coupling using simulation package.
11. Study Experiments:
   (a) Testing of newly electrified installation.
   (b) To measure the earth resistance by using Megger.
12. Rectifier circuits - Bridge Rectifier and diode clipping & clamping circuits using simulation package.

Laboratory Assessments for SEE:
1. Each Laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE)
2. Allocation of 50 marks for CIE Performance and journal write-up: Marks for each experiment = 30 marks / No. of proposed experiments. One Practical test for 20 marks, (5 write up, 10 conduction, calculation, results etc., 5 viva-voce).
3. Allocation of 50 marks for SEE: 25% write up, 50% conduction, calculation, results etc., 25% viva-voce.
Subject Code: UBT133M

Credits:

Exam Duration: 03 Hours

Prerequisite

Unit – I

01. Environment and Ecology:
Definition, environmental segments, Ecosystem and classification of ecosystem

02. Biogeochemical Cycles:
Hydrologic cycle, Carbon cycle, Nitrogen cycle, Sulphur cycle, Phosphorus cycle

03. Environmental Impacts of Human Activities on:
Agriculture, Housing, Transportation, Industry, Mining, Urbanization, Irrigation Projects, Environmental Impact Assessment (EIA), Sustainable development.

Unit – II

03. Natural Resources:
Forest, Water Mineral, food and Land resources.

04. Energy:
Growing Energy needs, Types & Sources of Energy, Renewable and non-renewable energy sources.

05. Renewable Energy:
Solar energy, Wind energy, Hydropower, Tidal energy, Ocean thermal energy, Geothermal energy, Biomass energy, Biogas, Biofuels, Hydrogen as fuel.

Non-renewable energy: Coal, Petroleum, Natural gas, Nuclear energy

Unit – III

05. Environmental Pollution:

06. Environmental Issues of Concern:
Population growth, Green house effect, Green house gas es and Global warning, Climate change, Acid rain, Ozone layer depletion, Animal husbandry and Solid waste management.

Unit – IV

07. Environmental Protection:
Introduction, Role of Government- various legislations, Functions, of government agencies, Environmental clearance.

Role of Non – Governmental Organization (NGO). Environmental movements, Environmental education, Woman and Education

Total: 26 Hours

Text Books:

References Books:

Question paper pattern for SEE:
1. Question paper is of objective type covering all the four units.
2. Students have to pass this subject compulsory for the award of degree. However, Marks will not be considered for awarding Grades / Class / Ranks.