### III Semester

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Credits</th>
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<tr>
<td>1</td>
<td>UMAXXXC</td>
<td>Engineering Mathematics III</td>
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<tr>
<td>2</td>
<td>UEC312C</td>
<td>Electronic Devices and Measurements</td>
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<tr>
<td>3</td>
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<td>Digital Electronics and Logic Design</td>
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<td>4</td>
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<td>Network Analysis</td>
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<tr>
<td>5</td>
<td>UEC315E</td>
<td>Electronic Circuits</td>
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<td>UEC316E</td>
<td>Human Resource Management I</td>
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<td>Credits: 4</td>
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<td>Contact Hours: 4 Hrs/Week</td>
<td>CIE Marks: 50</td>
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<td>SEE Marks: 50</td>
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**Unit I**

Passive components: construction, specification and application of resistors, capacitors and inductors. Switching diodes: introduction construction, operation and characteristics of tunnel diode, Schottky diode. Introduction to JFET, N-channel, P-channel, drain characteristics and transfer characteristics, introduction to JFET biasing: Gate bias, self-bias, voltage divider bias. Thyristors: Introduction, construction, operation and characteristics of SCR, TRAIC, UJT.

**Unit II**

Opto Electronic Devices: Light units, construction, operation and applications of LED, LCD, photoconductive cells, photodiode, solar cells, phototransistors, opto coupler photo multiplier tube and laser diode.

**Unit III**

Qualities of Measurements: Introduction, performance characteristics, static characteristics, error in measurement, types of static error, sources of error, dynamic characteristics, statistical analysis, standards of measurement. Digital Voltmeters: Introduction, Ramp technique, Dual slope integrating type DVM, resolution and sensitivity of Digital meters. Microprocessor based ramp type DVM.

**Unit IV**

Bridges: Introduction, Whetstones bridge, Kelvin’s bridge, Maxwell’s bridge, Hay’s bridge. AC bridges: Shearing bridge, Wien’s bridge, Resonance bridge. Signal Generators: Introduction, fixed and variable frequency AF oscillator, square wave and pulse generator, random noise generator, sweep-marker generator.

**Text Books:**

Reference Books:

2) William Cooper, “Modern Electronic Instrumentation & Measurement Techniques”.
<table>
<thead>
<tr>
<th>Course Title: Digital Electronics and Logic Design</th>
<th>Course Code: UEC313C</th>
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### Unit I

Principles of combinational logic: Definition of combinational logic, canonical forms, generation of switching equations from truth tables, K-map simplification for 3 and 4 variables, incompletely specified functions (don’t care terms), simplifying maxterm equations, Quine-McCluskey minimization technique, Quine-McCluskey method using don’t care terms, reduced prime implicant tables, map entered variables.

### Unit II

Analysis and design of combinational logic: General approach, decoders-BCD decoders, encoders, digital multiplexers as Boolean function generators, adders and subtractors, cascading full adders, look ahead carry, binary comparators. Sequential circuits 1: Basic bistable element, latches, SR latch, application of SR latch, switch debouncer, the SR Latch, gated SR latch, gated D latch.

### Unit III

Master-slave SR flip-flops, master slave JK flip-flop, Edge triggered flip-flop, Positive edge triggered D flip-flop, negative edge triggered D flip-flop. Sequential circuits 2: Characteristic equations, registers, counters, binary ripple counters, synchronous binary counters, counters based on shift registers, design of synchronous counters, design of asynchronous counter using clocked JK, D, T and SR flip-flops.

### Unit IV

Synchronous sequential circuits: Introduction to Mealy and Moore models, state machine notation, synchronous sequential circuit analysis, construction of state diagrams.

### Text Books:

Reference Books:

4) Malvino and Leech, “Digital Principles & Applications”, PHI.
<table>
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<tr>
<th>Course Title: Network Analysis</th>
<th>Course Code: UEC314C</th>
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<td>Total Marks: 100</td>
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</table>

**Unit I**

Basic concepts: Concept of voltage, current and power, ideal and practical representation of energy sources, source transformation, network reduction using star-delta transformation, mesh and node analysis with dependent and independent sources for AC and DC networks, concept of super mesh and super node.

**Unit II**

Network theorems: Superposition, Reciprocity, Thevenin’s, Norton’s, Millaman’s and Maximum power transfer theorems. Network topology: Graph of a network, concept of tree and co-tree, incidence matrix, cutset matrix, tieset matrix, analysis of networks, network equilibrium equations.

**Unit III**

Resonant circuits: Series and parallel resonant circuits, frequency of resonance, frequency responses, Q-factor, bandwidth. Two port network parameters: z, y, h, transmission parameters, and relationship between parameters.

**Unit IV**


**Text Books:**


**Reference Books:**

<table>
<thead>
<tr>
<th>Course Title: Electronic Circuits</th>
<th>Course Code: UEC315C</th>
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<tr>
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</table>

## Unit I


## Unit II


## Unit III


## Unit IV


## Text Books:

### Reference Books:

2. Allen Mottershed, “Electronic Devices and Circuits”, PHI.

4. M. D. Singh, K. B. Khanchandani “Power Electronics”, TMH.
List of Experiments

1) V-I characteristics of silicon diode and its application.
2) Frequency response of RC coupled amplifier.
3) Oscillator circuits (RC and LC oscillators).
4) V-I characteristics of SCR and TRIAC.
5) V-I characteristics of MOSFET.
6) Controlled full wave rectifier using RC Triggering circuit and using modules.
7) Voltage (impulse) commutated chopper - both constant frequency and variable frequency operations.
8) Parallel/ series inverter.
9) SCR turn off circuits using LC /Auxiliary commutation.
10) Speed control of AC/DC motor.

Simulation
1) DC excitation of RL, RC, and RLC- circuits.
2) AC excitation of RL, RC, and RLC- circuits.
3) Rectifier circuits.
4) Amplifier circuits.
5) Oscillator circuits.
List of Experiments

1) Simplification, realization of Boolean expression(s) using basic logic gates.
2) Implementation of Boolean expression(s) using universal gates.
3) Realization of full-adder and full-subtractor using basic logic gates.
4) Realization of
   a) Parallel adder / subtractor using 7483 chip
   b) Decoder chip to drive LED display
5) Design and implementation of code converters (any two).
6) Implementation of three variable Boolean expression(s) using
   a) 8:1 MUX
   b) 4:1 MUX.
7) Implementation of three variable Boolean expression(s) using 3:8 decoder and gates.
8) Design of two-bit comparator using basic logic gates and study of 7485 magnitude comparator.
9) Truth table verification of flip-flops:
   (a) Master Slave JK flip-flop implementation using only NAND gates
   (b) JK flip flop using 7476.
10) Design of
    a) 4-bit asynchronous counter using JK flip-flop (7476)
    b) Mod-n asynchronous counter (7476) (n <= 4)
11) Design of
    a) UP counter using 74193
    b) DOWN counter using 74193
12) Design of shift registers using 7495 viz. SIPO, SISO, PISO, PIPO shift right, shift left.
13) Simulate any 6 experiments covering both combinational and sequential circuits using circuit simulator- PROTEUS VSM.