### III Semester

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UMAXXXXC</td>
<td>Engineering Mathematics III</td>
<td>4.0</td>
</tr>
<tr>
<td>2</td>
<td>UEC322C</td>
<td>Electronic Devices and Circuits</td>
<td>4.0</td>
</tr>
<tr>
<td>3</td>
<td>UEC323C</td>
<td>Digital Electronics and Logic Design</td>
<td>4.0</td>
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<tr>
<td>4</td>
<td>UEC324C</td>
<td>Network Analysis</td>
<td>4.0</td>
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<tr>
<td>5</td>
<td>UEC325C</td>
<td>Human Resource Management</td>
<td>3.0</td>
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<tr>
<td>6</td>
<td>UEC326C</td>
<td>Advanced “C” Programming</td>
<td>4.0</td>
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<tr>
<td>7</td>
<td>UEC327L</td>
<td>Electronic Devices and Circuits Lab</td>
<td>1.5</td>
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<tr>
<td>8</td>
<td>UEC328L</td>
<td>Digital Electronics Lab</td>
<td>1.5</td>
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<tr>
<td>9</td>
<td>UMAXXXXM</td>
<td>Advanced Mathematics I</td>
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<td></td>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>
Course Title: Electronic Devices and Circuits
Course Code: UEC322C

Credits: 4  
Teaching Hours: 52 Hrs (13 Hrs/Unit)  
Contact Hours: 4 Hrs/Week

CIE Marks: 50  
SEE Marks: 50  
Total Marks: 100

Department: Electronics and Communication Engg.
Designation: Core
Prerequisites: Basic Electronics, Engineering Physics

Course Objectives:
1. To provide the knowledge about construction, operation and characteristics of JFET, MOSFET and Thyristors.
2. To study the construction, operation, characteristics and applications of optoelectronic and miscellaneous devices.
3. To gain knowledge of multistage amplifiers, negative feedback amplifiers and power amplifiers.
4. To study power electronic circuits such as controlled rectifiers, DC choppers and inverters.

Course Outcomes:
A student who successfully completes this course should be able to
1. Understand the basic principle of operation and characteristics of JFET, MOSFET and Thyristors.
2. Differentiate the characteristics and their importance of different optoelectronic and miscellaneous devices.
3. Analyze multistage amplifier circuits, amplifiers with negative feedback and power amplifiers.
4. Acquire knowledge and carryout analysis of power electronic circuits such as controlled rectifiers, DC choppers and inverters.

The topics that enable to meet the above objectives and course outcomes are given below:

Unit I (13 hours)
Field Effect Transistors: Introduction, construction, Operation and characteristics of JFETs, transfer characteristics, important relationships, depletion type MOSFET, enhancement type MOSFET, VMOS, CMOS, MESFETS, practical applications.  
Thyristors: Introduction, construction, Operation and characteristics of SCR, TRIAC, UJT,SCR gate triggering circuits, comparison between Transistors and Thyristors.  
Diode applications: Clippers and Clampers

Unit II (13 hours)
Optoelectronic Devices: Light units, Light emitting diode(LED), Liquid crystal displays(LCD), Photo conductive cell, Photo diode and Solar cell, Phototransistors, optocouplers.  
Miscellaneous Devices: Schottky diodes, Varactor diodes, Power diodes, Tunnel diodes, IR Emitters, Thermistors.
Unit III (13 hours)

Unit IV (13 hours)

Reference Books

Course Title: Digital Electronics and Logic Design  
Course Code: UEC323C  
Credits: 4  
Teaching Hours: 52 Hrs (13 Hrs/Unit)  
Contact Hours: 4 Hrs/Week  
CIE Marks: 50  
SEE Marks: 50  
Total Marks: 100  
Department: Electronics and Communication Engg.  
Designation: Core  
Prerequisites: Basic Electronics

Course Objectives:
1. Simplify the Boolean function using a) theorems & postulates b) Karnaugh-map c) Quine McCluskey method and d) map entered variable method.
2. Design and implement Boolean functions using a) basic logic gates b) universal gates c) decoders & gates and d) multiplexers.
3. Understand the concept and working of latches, flip-flops and master salve flip-flop.
4. Design and implement synchronous sequential circuits and ripple counters.

Course Outcomes:
A student who successfully completes this course should be able to
1. Simplify given Boolean functions using Boolean algebra, K-map, Quine Mccluskey and map entered variable method.
2. Design and implement combinational circuits.
3. Realize different types of latches, flip-flops and master salve flip-flop.
4. Design sequential circuits and implement it using any type of flip flop and gates.

The topics that enable to meet the above objectives and course outcomes are given below:

Unit I (13 hours)
Principles of combinational logic & Design: Review of Boolean algebra, simplification & implementation of Boolean expression using basic gates & universal gates. Definition of combinational logic, canonical forms, generation of switching equations from truth tables, K-maps (up to 5 variables), Quine-McCluskey minimization technique, Map entered variables.

Unit II (13 hours)
<table>
<thead>
<tr>
<th>Unit III (13 hours)</th>
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<table>
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<tr>
<th>Unit IV (13 hours)</th>
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<tbody>
<tr>
<td>Sequential circuit design-II: Modeling clocked synchronous sequential network behavior, state table reduction, the state assignment, completing the design of clocked synchronous sequential networks. Digital integrated circuits: Introduction, diodes as switches, Diode transistor logic, evolution from DTL to TTL, TTL NAND &amp; TTL NOR circuit realization and operation.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference Books</th>
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</thead>
<tbody>
<tr>
<td>Course Title: Network Analysis</td>
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<tr>
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<tr>
<td>Credits: 4</td>
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<tr>
<td>CIE Marks: 50</td>
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<tr>
<td>Contact Hours: 4 Hrs/Week</td>
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</tbody>
</table>

Department: Electronics and Communication Engg.
Designation: Core
Prerequisites: Basic Electronics and Basic Electrical Sciences

Course Objectives:
The objectives of the course is to introduce the students,
1. Concept of mesh and node analysis, source transformation and star-delta conversion for network simplification.
2. Fundamentals of network theorems and network topology.
3. Concept of resonance and two port network parameters.
4. Concept of Laplace transformation, attenuators and equalizers.

Course Outcomes:
A student who successfully completes this course should be able to
1. Simplify networks using source transformation, star-delta conversion and can be able to apply KVL, KCL, nodal and mesh analysis to AC and DC networks.
2. Apply network theorems and topology for complex networks to find response.
3. Analyze series and parallel resonant circuits, able to find different network parameters.
4. Apply concept of Laplace transformation to networks and waveforms, able to design attenuators and simple equalizers.

The topics that enable to meet the above objectives and course outcomes are given below:

**Unit I (13 hours)**
Basic concepts: Concept of voltage, current and power, ideal and practical representation of energy sources, source transformation, network reduction using star-delta transformation, mesh current and node voltage analysis with dependent and independent sources for AC and DC networks, concept of super mesh and super node

**Unit II (13 hours)**
Network theorems: Superposition, Reciprocity, Thevenin’s, Norton’s, Millman’s and Maximum power transfer theorems. Network topology: Graph of a network, concept of tree and co-tree, incidence matrix, tieset matrix, cutset matrix, analysis of networks, network equilibrium equations.
**Unit III (13 hours)**
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 (13 hours)**

**Reference Books**
<table>
<thead>
<tr>
<th>Course Title: Human Resource Management</th>
<th>Course Code: UEC325C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits: 3</td>
<td>Teaching Hours: 40 Hrs (10 Hrs/Unit)</td>
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<tr>
<td></td>
<td>Contact Hours: 3 Hrs/Week</td>
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<tr>
<td>CIE Marks: 50</td>
<td>SEE Marks: 50</td>
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<td></td>
<td>Total Marks: 100</td>
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</tbody>
</table>

**Department**: Electronics and Communication Engg.  
**Designation**: Core  
**Prerequisites**: Basic communication skills

**Course Objectives:**
The course is intended to provide the knowledge about
1. The purpose of introductory is to emphasis the strategic role of HRM in managing an organisation.
2. The HRM tries to clear the fog surrounding the recruitment process and to expose the students to various steps involved in selection process.
3. The purpose of career management is to enable the clear view of the process of human resource planning, as it is currently practiced in most organisation.
4. The purpose is to impress upon the students that all appraisals involve judgments which are not always fair and therefore post appraisal is needed.
5. The purpose of IHRM is to bring out the importance of designing an effective compensation plan that takes care of legal stipulations, industry practices, employee expectations, competitive pressure etc. for expatriate.

**Course Outcomes:**
A student who successfully completes this course should be able to
1. HRM aims at achieving organisational goals meet the expectations of the employees.
2. Recruitment is the process of locating and encouraging potential applicants to apply for existing or anticipated job openings and it is influenced by economic, social, technological, legal etc.
3. Career management includes both organisational actions and individual actions aimed at setting career goals, implementing strategies and measuring results.
4. Establishing pay rates involves evaluate jobs, conduct salary survey, develop pay grades and fine tune pay rates.
5. International HRM is the process of procuring allocating and effectively utilizing human resources in multinational company.

The topics that enable to meet the above objectives and course outcomes are given below:

**Unit 1 (10 hours)**
<table>
<thead>
<tr>
<th>Unit II (10 hours)</th>
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<table>
<thead>
<tr>
<th>Unit III (10 hours)</th>
<th></th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Unit IV (10 hours)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>International HRM: The growth of international business, HR and the international business challenge, effect of inter country difference on HRM, international staffing, international compensation and appraisal, international labour relations and Information Technology and HR.</td>
<td></td>
</tr>
</tbody>
</table>

**Reference Books**

Course Title: Advanced C Programming  
Course Code: UEC326C  
Credits: 4  
Teaching Hours: 26 Hrs  
Contact Hours: 6 Hrs/Week (2-2-2)  
CIE Marks: 50  
SEE Marks: 50  
Total Marks: 100  

Department: Electronics and Communication Engg.  
Designation: Core  
Prerequisites: Computer Concepts & ‘C’ Programming.  

Course Objectives:  
The course is intended to provide the knowledge about  
1. Advanced C programming.  
2. The concepts of pointers and how to write advanced C programming using pointers.  
3. The concept of dynamic memory allocation.  
4. The gap between basic C programming and data structures courses.  

Course Outcomes:  
A student who successfully completes this course should be able to  
1. Write advanced C programming for a given algorithm.  
2. Write C programming using pointers to arrays, functions, structures and unions.  
3. Understand the dynamic memory allocations concept.  
4. Take course on data structures.  

The topics that enable to meet the above objectives and course outcomes are given below:  

Unit I (06 hours)  
Review of C fundamentals: Variables and constants data types, operators and expressions, input/output statements, control statements, file handling.  

Unit II (06 hours)  
## Unit III (07 hours)

## Unit IV (07 hours)

## Reference Books
Course Title: Electronic Devices and Circuits Lab

Course Code: UEC327L

Credits: 1.5  
Teaching Hours: 40 Hrs  
Contact Hours: 3Hrs/Week

CIE Marks: 50  
SEE Marks: 50  
Total Marks: 100

Department: Electronics and Communication Engg.
Designation: Core

Course Objectives:
The objectives of Electronic Devices and Circuits Laboratory are
1. To verify the V-I characteristics and working of commonly used electronic devices.
2. To understand the design principles of rectifiers (controlled and uncontrolled), voltage regulators, amplifiers and oscillators.
3. Realization and analysis of applications such as rectifiers, controlled rectifiers, voltage regulators, amplifiers, oscillators, choppers and inverters.
4. To understand and use electronic devices and circuits simulation tools.
5. To inculcate the practice of thinking and exploring them through experimentations.

Course Outcomes:
After completion of Electron Devices and Circuits Laboratory the students are able to
1. Distinguish different semiconductor devices based on their characteristics.
2. Realize rectifiers, controlled rectifiers, amplifiers, regulators, oscillators, choppers and inverters.
3. Decide the type of rectifiers, controlled rectifiers, amplifiers, regulators and oscillators for a given specifications.
4. Simulate and carryout analysis of basic electronic circuits.
5. Implement simple electronic applications/hobby projects.

The Experiments that enable to meet the above objectives and course outcomes are given below:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>HARDWARE EXPERIMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V-I characteristics and their analysis of diodes.</td>
</tr>
<tr>
<td>2</td>
<td>Analysis of diode as half-wave and full-wave rectifier.</td>
</tr>
<tr>
<td>3</td>
<td>V-I characteristics and their analysis of Zener diodes of different breakdown voltages.</td>
</tr>
<tr>
<td>4</td>
<td>Zener diode as voltage regulator and its regulation analysis.</td>
</tr>
<tr>
<td>5</td>
<td>Input and output characteristics and their analysis of Bipolar Junction Transistor (BJT) in common base, common collector and common emitter configuration.</td>
</tr>
<tr>
<td>6</td>
<td>Design, implementation and frequency response of transistor (BJT) as an amplifier</td>
</tr>
<tr>
<td>7</td>
<td>Design and implementation of transistor (BJT) as an oscillator.</td>
</tr>
<tr>
<td>8</td>
<td>Input and output characteristics and their analysis of field effect transistor (FET).</td>
</tr>
<tr>
<td>9</td>
<td>Design, implementation and frequency response of FET as an amplifier.</td>
</tr>
<tr>
<td>10</td>
<td>V-I characteristics and analysis of unijunction transistor (UJT).</td>
</tr>
<tr>
<td>11</td>
<td>Implementation of UJT as a relaxation oscillator.</td>
</tr>
<tr>
<td>12</td>
<td>V-I characteristics and analysis of silicon controlled rectifier (SCR).</td>
</tr>
<tr>
<td>13</td>
<td>Study of SCR as half-wave and full-wave controlled rectifier.</td>
</tr>
<tr>
<td>14</td>
<td>Study of DC chopper and inverter.</td>
</tr>
<tr>
<td>15</td>
<td>Simulation and analysis of DC and AC excited RL and RC circuits.</td>
</tr>
</tbody>
</table>
Course Title: Digital Electronics & Logic Design Lab

Credits: 1.5
Teaching Hours: 40 Hrs
Contact Hours: 3 Hrs/Week

Course Code: UEC328L

CIE Marks: 50
SEE Marks: 50
Total Marks: 100

Department: Electronics and Communication Engg.
Designation: Core

Course Objectives:
The objectives of Digital Electronics & Logic Design Laboratory are
1. To design basic combinational circuits and implement it using a) basic logic gates b) universal gates, c) multiplexers and d) decoder and gates.
2. To understand and realize latches and flip flops.
3. To design and implement asynchronous counters.
4. To design and implement synchronous counters and shift registers

Course Outcomes:
After completion of Digital Electronics & Logic Design Laboratory the students are able to
1. Should be able to design combinational circuits and implement it using a) basic logic gates b) universal gates, c) multiplexers and d) decoder and gates.
2. Should be able to realize latches and flip flops.
3. Should be able to design and implement asynchronous counters.
4. Should be able to design and implement synchronous counters and shift registers.

The Experiments that enable to meet the above objectives and course outcomes are given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>LIST OF THE EXPERIMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Simplification, realization of Boolean expression(s) using basic logic gates.</td>
</tr>
<tr>
<td>2</td>
<td>Implementation of Boolean expression(s) using universal gates.</td>
</tr>
<tr>
<td>3</td>
<td>Design of full adder and full subtractor implementation using basic logic gates.</td>
</tr>
</tbody>
</table>
| 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 up counter using JK flip-flop (7476) |
| b. 4-bit asynchronous down counter using JK flip-flop (7476) |
| c. 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.  |