SCHEME OF INSTRUCTION & EXAMINATION  
B.E.II YEAR (CSE) (Autonomous)  

COMPUTER SCIENCE & ENGINEERING  

Semester-I  

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Syllabus Ref-No.</th>
<th>SUBJECT</th>
<th>Scheme of Instruction</th>
<th>Scheme of Examination</th>
<th>Periods per Week</th>
<th>Duration in Hours</th>
<th>Maximum Marks</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>L/T D/P</td>
<td>Univ-Sessionals</td>
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<td></td>
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<tr>
<td>1</td>
<td>CS 201 UE</td>
<td>Data Structures</td>
<td></td>
<td></td>
<td>4 - 3</td>
<td>75</td>
<td>25</td>
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<tr>
<td>2</td>
<td>CS 202 UE</td>
<td>Discrete Mathematics</td>
<td></td>
<td></td>
<td>4 - 3</td>
<td>75</td>
<td>25</td>
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</tr>
<tr>
<td>3</td>
<td>CS 203 UE</td>
<td>Logic &amp; Switching Theory</td>
<td></td>
<td></td>
<td>4 - 3</td>
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<td>4</td>
<td>CS 204 UE</td>
<td>Computer Organization</td>
<td></td>
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<tr>
<td>5</td>
<td>MT 201 UE</td>
<td>Mathematics-III</td>
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<td>4 - 3</td>
<td>75</td>
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</tr>
</tbody>
</table>

THEORY  

<table>
<thead>
<tr>
<th>P R A C T I C A L S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CS 231 UE</td>
</tr>
<tr>
<td>Data Structures Lab</td>
</tr>
<tr>
<td>2 EC 241 UE</td>
</tr>
<tr>
<td>Basic Electronics Lab</td>
</tr>
<tr>
<td>3 EE 241 UE</td>
</tr>
<tr>
<td>Electrical Engineering Lab</td>
</tr>
</tbody>
</table>

TOTAL  

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B.E. II Year (Computer Science & Engineering) I-Semester

CS 201 UE

DATA STRUCTURES

Instruction 4 Periods per week
Duration of University Examination 3 Hours
University Examination 75 Marks
Sessionals 25 Marks
Credits 4

UNIT -I
Performance and complexity analysis: Space complexity, time complexity, asymptotic notation (big oh), complexity analysis examples.
Linear list-array representation: vector representation, multiple lists single array.
Linear list-linked representation: singly linked lists, circular lists, doubly linked lists, Applications (polynomial arithmetic).
Arrays and matrices: row and column major representations, special matrices, sparse matrices.

UNIT -II
Stacks: Array representation, linked representation, applications (recursive calls, infix to postfix, postfix evaluation).
Queues: Array representation, linked representation.
Skip lists and hashing: skip lists representation, hash table representation, application- text compression.

UNIT - III
Trees: Definitions and properties, representation of binary trees, operations, binary tree traversal. Binary search trees: Definitions, operations on binary search trees.
Balanced search trees: AVL trees, B-trees.

UNIT -IV
Graphs: Definitions and properties, representation, graph search methods (DFS and BFS)
Application of graphs: shortest path algorithm (Dijkstra), minimum spanning tree (Prim’s and Kruskal's algorithms).
UNIT - V

**Sorting and complexity analysis:** Selection sort, Insertion sort, Quick sort, Merge sort, Closest pair of points, Heap sort.

**Suggested Reading:**

B.E. II Year (Computer Science & Engineering) I - Semester

CS 202 UE

DISCRETE MATHEMATICS

Instruction 4 Periods per week
Duration of University Examination 3 Hours
University Examination 75 Marks
Sessionals 25 Marks
Credits 4

UNIT- I
Mathematical Logic: Statements and Notation, Connectives, Normal Forms, Theory of Inference, Predicate Calculus.

UNIT -II

UNIT -III
Recurrence relations – generating functions of sequences, coefficients of generating functions, Solution of Recurrence relations – substitution, generating functions, characteristic roots, Non-homogeneous recurrence relations.

UNIT - IV
Algebraic Structures: Algebraic system-general properties, semi groups, monoids, homomorphism, groups, residue arithmetic, group codes and their applications.

UNIT - V
Suggested Reading:

With effect from Academic Year 2012-13

B.E. II Year (Computer Science & Engineering) I - Semester

CS 203 UE

LOGIC & SWITCHING THEORY

<table>
<thead>
<tr>
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**UNIT -I**

**Binary Systems:** Introduction to Number Systems, Binary Logic.

**Boolean Algebra:** Axiomatic definition of Boolean algebra operators, Postulates and theorems, Boolean functions, Canonical forms and Standard forms, Simplification of Boolean functions using theorems.

**UNIT -II**

**Minimization of switching functions:** Karnaugh map method, Quine-McCluskey tabular method, Determination of Prime implicants and Essential prime implicants.

**UNIT -III**

**Combinational Logic Design:** Single output and multiple output combinational circuit design, AND-OR, OR-AND and NAND/NOR realizations, Exclusive-OR and Equivalence functions, Binary adders, Subtractors, Code conversion, Decoders, Multiplexers, Encoders.

**UNIT -IV**

Introduction to Relay Networks, Analysis and Synthesis of Contact Networks.

**Symmetric Networks:** Properties of Symmetric functions, Synthesis of Symmetric networks, Identification of Symmetric functions.

**UNIT -V**

**Introduction to Sequential Logic Design:** Latch, Various types of flip-flops and their excitation tables, Classification of Sequential circuits, The Sequential Circuit Model, Design of simple Synchronous sequential circuits such as counters, Introduction to Asynchronous machines.
Suggested Reading:

B.E. II Year (Computer Science & Engineering) I - Semester

CS 204 UE

**COMPUTER ORGANIZATION**

- **Instruction**: 4 Periods per week
- **Duration of University Examination**: 3 Hours
- **University Examination**: 75 Marks
- **Sessionals**: 25 Marks
- **Credits**: 4

**UNIT - I**

**Data Representation**: Data types, Complements, Fixed and Floating Point representations, other Binary codes.

**Overview of Computer function and Interconnection**: Computer components, Interconnection structures, Bus interconnection, Bus structure, Data transfer.

**UNIT - II**

**Register Transfer Microoperations**: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic, Logic and Shift microoperations, Arithmetic Logic Shift Unit.

**Basic Computer Organization and Design**: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory reference instruction, Input-Output and Interrupt.

**UNIT - III**

**Microprogrammed Control**: Control memory, Address Sequencing, Microprogram example, Design of Control Unit.

**Central Processing Unit**: General Register Organization, Stack Organization, Instruction formats, Addressing modes, Data Transfer and Manipulation, Program control, RISC.

**Computer Arithmetic**: Addition and Subtraction, Multiplication, Division, Floating Point Arithmetic Operations, Decimal Arithmetic Unit.

**Parallel Processing, Pipelining**: Arithmetic, Instruction and RISC Pipelines.

**UNIT - IV**

**Input-Output Organization**: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access(DMA), I/O Processor, Serial Communication.
UNIT -V
Memory Organization: Memory hierarchy, Main Memory, RAM and ROM, Auxiliary memory, Associative memory, Cache memory, Virtual memory, Memory Management hardware.

Suggested Reading:
MT 201 UE

**MATHEMATICS-III**

Instruction 4 Periods per week
Duration of University Examination 3 Hours
University Examination 75 Marks
Sessionals 25 Marks
Credits 4

**Objectives:**

- To introduce Laplace transforms, Functions of Complex Variables, the power series expansions, bilinear transformation and conformal mapping.
- To introduce and discuss various numerical methods like solving Algebraic and Transcendental equations, interpolation, numerical differentiation and solutions of ordinary differential equations.
- To introduce Normal and \( \chi^2 \) distributions, and the tests of significance, i.e. t-test, F-test and \( \chi^2 \) test.

**UNIT- I**

**Laplace transformation:** Introduction of Laplace transforms, sufficient condition for existence of Laplace transform, Laplace transform of derivatives, Laplace transform of integrals, Translation theorems (I&II shifting theorems), Differentiation of Laplace transform(Multiplication by \( t \)), Integration of Laplace transform( Division by \( t \) ), Convolution theorem, Solving initial value problems using Laplace transform.

**UNIT-II**

**Functions of Complex Variables:** Limits and continuity of function, differentiability and analyticity, necessary & sufficient conditions for a function to be analytic, Cauchy- Reimann equations in polar form, harmonic functions, complex integration, Cauchy’s integral theorem, extension of Cauchy’s integral theorem for multiple connected regions, Cauchy’s integral formula, Cauchy’s formula for derivatives and their applications.
UNIT-III
Power series, Taylor’s series, Laurent’s series, zeros and singularities, residues, residue theorem, evaluation of real integrals using residue theorem, bilinear transformation, conformal mapping.

UNIT-IV

UNIT-V
**Probability and Statistics:** Introduction to distributions, Normal and $\chi^2$ distributions, Tests of significance: t-test, F-test, $\chi^2$ - test.

**Suggested Reading:**


**Reference Books:**

5. Dr.M. Venkata Krishna “Probability and Statistics”.
B.E. II Year (Computer Science & Engineering) I - Semester

CS 231 UE

DATA STRUCTURES LAB

Instruction 3 Periods per week
Duration of University Examination 3 Hours
University Examination 50 Marks
Sessionals 25 Marks
Credits 2

Programming exercise using C++ for the following:

1. Implementation of Singly Linked List, Doubly Linked List and Circular List.
2. Implementation of Stacks, Queues (using both arrays and linked lists).
3. Infix to Postfix conversion, evaluation of postfix expression.
4. Polynomial arithmetic using linked list.
5. Implementation of Binary Search and Hashing.
6. Implementation of recursive and iterative traversals on binary tree.
7. Implementation of Binary Search Tree.
8. Implementation of operations on binary tree (delete entire tree, copy entire tree, mirror image, level order, search for a node etc.)
9. Implementation of Selection, Shell, Merge and Quick sorts.
10. Implementation of Heap Sort.
11. Implementation of operations on AVL Trees.
12. Implementation of traversal on Graphs.

Note: To debug these programs it is recommended to use a debugging tool.
B.E. II Year (Computer Science & Engineering) I - Semester

EC 241 UE

BASIC ELECTRONICS LAB

Instruction 3 Periods per week
Duration of University Examination 3 Hours
University Examination 50 Marks
Sessionals 25 Marks
Credits 2

Experiments to be done
1. Characteristics of Semi-conductor diodes (Ge, Si, Ze).
2. Static Characteristics of BJT (CE).
3. Static Characteristics of FET.
4. Full wave Rectifier with and without filters.
5. Transistor as an amplifier.
6. CRO Applications.
8. Voltage series FB amplifier.
9. RC phase shift oscillator, Hartley oscillator.
10. Operational amplifier applications.
11. RC coupled amplifier frequency response.
12. Emitter follower and Source Follower.

Suggested Reading:
B.E. II Year (Computer Science & Engineering) I - Semester

EE 241 UE

**ELECTRICAL ENGINEERING LAB**

<table>
<thead>
<tr>
<th>Instruction</th>
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<tbody>
<tr>
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<td>University Examination</td>
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<td>Sessionals</td>
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<tr>
<td>Credits</td>
<td>2</td>
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**Experiments to be done**

1. Verification of Kirchoff’s Laws
2. Verification of Thevinin’s & Norton’s Theorems
3. Study of Three-Phase Balanced Circuits
4. Measurement of Power by Two – Wattmeter Method
5. Study of Single – Phase RLC Series Circuits
6. Magnetization Curve of a Separately Excited DC Generator
7. Load Characteristics of Shunt Generator
8. Performance Characteristics of Shunt Motor
9. Speed Control of DC Shunt Motor
10. O.C. and S.C. Tests on Single – Phase Transformer
11. Load Test on Single – Phase Transformer
12. Load Test on Three – Phase Induction Motor

**Note:** At least TEN experiments should be conducted in the Semester.