FIVE-YEAR INTEGRATED
MASTER OF SCIENCE IN (SOFTWARE ENGINEERING)
M.S.(SOFTWARE ENGINEERING) - M.S(SE)

SYLLABUS

For

2nd Year

I & II -Semesters

With effect from 2007-08 admitted batch

Chairman
Board of Studies
(2005-08)

Department of Computer Science & Systems Engineering
College of Engineering
Andhra University
Visakhapatnam
## Course Structure and Scheme of Examination

**With Effect From 2007-08 Admitted Batch**

### 2nd year I Semester (Common with M.S.(IT))

<table>
<thead>
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<th>Sub. Ref. No.</th>
<th>Name of the Subject</th>
<th>Periods</th>
<th>Max. Marks</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Tutorial</td>
</tr>
<tr>
<td>MSSE 2.1.1</td>
<td>Basic Electronics (Common with MSIT 2.1.1)</td>
<td>3</td>
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<tr>
<td>MSSE 2.1.2</td>
<td>Discrete Mathematical Structures (Common with MSIT 2.1.2)</td>
<td>3</td>
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<tr>
<td>MSSE 2.1.3</td>
<td>Data Structures (Common with MSIT 2.1.3)</td>
<td>3</td>
<td>1</td>
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<tr>
<td>MSSE 2.1.4</td>
<td>Digital Logic Design (Common with MSIT 2.1.4)</td>
<td>3</td>
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<tr>
<td>MSSE 2.1.5</td>
<td>Probability, Statistics and Queuing Theory (Common with MSIT 2.1.5)</td>
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<td>MSSE 2.1.6</td>
<td>Electronics Lab (Common with MSIT 2.1.6)</td>
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<td>MSSE 2.1.7</td>
<td>Data Structures Lab (Common with MSIT 2.1.7)</td>
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<td><strong>TOTAL</strong></td>
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</table>
MSSE 2.1.1                          BASIC ELECTRONICS
(Common with MSIT 2.1.1)

Instruction:  3 Periods & 1 Tut /week         Sessional Marks:  30
Univ. Exam :  3 Hours                        Univ-Exam-Marks:70

I. Semiconductors:
   Electronic Emission from metal carrier concentration in an intrinsic Semiconductors
   open circuited PN junction – diffusion.

II. PN Junction Diode:
   PN Junction Diode, VI Characteristics of PN Junction Diode, capacitance effects in
   PN Junction Diode, Quantitative theory of PN Junction Diode.

III. Special Devices:
   Principles, Working of zero diode, Tunnel diode, Varactor diode, Schottky diode,
   SCR and UJT.

IV. Transistors:
   The bipolar junction Transistor – Operation of PNP and NPN Transistors –
   Transistor Circuit configurations- characteristics of a CE configurations – h
   parameter, low frequency small signal equivalent circuit of a Transistor.

V. Transistor Biasing and thermal stabilization:
   Transistor Biasing, stabilization, Different methods of transistor biasing – Fixed
   bias, Collector feedback bias – self bias – Bias compensation.

VI. Field Effect Transistors:
   Junction Field Effect Transistors (JFET) – JFET characteristics, JFET Parameters,
   Small equivalent circuit – MOSFETS – Depletion and Enhancement MOSFETS.

VII. Rectifying circuits:
   Half wave and full wave rectifiers – Bridge rectifiers – rectifier efficiency, Ripple
   and regulation – Shunt capacitor filter – Zener regulation.

VIII. Transistor Amplifiers:
   CE, CB, CC amplifier configurations – Analysis using h- parameters – Multistage
   amplifier – RC coupled amplifier – frequency response curve and bandwidth.

TEXT BOOK:
   Electronic Device and Circuits by Sanjeev Gupth.

REFERENCE:
   Integrated Electronics by Millman & Halkias.
MSSE 2.1.2  DISCRETE MATHEMATICAL STRUCTURES
(Common with MSIT 2.1.2)

Instruction:  3 Periods & 1 Tut/week                   Sessional Marks:  30
Univ. Exam :  3 Hours                                  Univ-Exam-Marks:70


Recurrence Relations: Generating Functions of Sequences-Calculating their Coefficients-Recurrence relations-Solving recurrence relations-Method of characteristic Roots- Non-homogeneous Recurrence relations and their solutions

Relations and Digraphs: Relations and Directed Graphs-Special Properties of Binary relations- Equivalence Relations-Ordering Relations-Lattices and Enumeration-Operations on relations-Paths and Closures-Directed Graphs and Adjacency matrices- Applications of sorting, searching and topological sorting.

Graphs: Basic concepts-Isomorphism-subgraphs-Planar Graphs-Euler’s formula-Multigraphs and Euler circuits-Hamiltonian graphs-Chromatic numbers-Four color theorem.

Trees: Trees and their properties-Trees as graphs-spanning trees-Directed trees-Binary trees-Their traversals-Arithmetic and Boolean expressions as trees- height balanced trees.

Text Book:

Reference Books:
2) “Discrete mathematics” by Richard Johnsonbaug Pearson Education, New Delhi
Introduction to Data Structures: Information and Meaning – Representation of Multi-Dimensional Arrays _ Review of C Programming.

The Stack: Primitive operations – As an Abstract Data Type – Implementing the Stack operations in C.

Infix, Postfix and Prefix: Definitions, Evaluation and Conversions using C.


Queues and Lists: The Queue as Abstract Data Type – Sequential Representation _Types of Queues – Operations – Implementation in C.

Linked List: Operations – Implementation of Stacks, Queues and priority Queues in C.


Tree Searching: Insertion into a Binary Search Tree – Deleting from a Binary Search Tree – Efficiency of Binary Search Tree operation


Linked Representation of Graphs: Dijkstra’s Algorithm – Organizing the set of Graph Nodes – Application to Scheduling and its implication. Graph Traversal and Spanning Forests – Undirected Graph and their Traversals, Applications and Efficiency – Minimal Spanning Trees –Prim’s and Kruskal’s Algorithms.
MSSE 2.1.4       DIGITAL LOGIC DESIGN  
(Common with MSIT 2.1.4) 

Instruction:  3 Periods & 1 Tut. /week       Sessional Marks:  30 
Univ.-Exam : 3 Hours                           Univ-Exam-Marks: 70 

1. **Binary Systems, Boolean Algebra and Logic Gates.**  

2. **Combinational Logic Design, Gate-Level Minimization.**  
   **Combinational Logic**  

3. **Sequential Logic Design, Synchronous Sequential Logic**  
   **Registers and Counters.**  
   **Fundamentals of Asynchronous Sequential Logic**  

4. **Memory and Programmable Logic**  


**REFERENCE BOOKS**:  
1. Digital Logic Design Principles, Norman Balabanian and Bradley Carlson,  
   John Wiley & Sons(Asia) Pte. Ltd., 2002 
2. Fundamentals of Digital Circuits, A. Ananda Kumar, PHI, 2002
MSSE 2.1.5 PROBABILITY, STATISTICS & QUEUING THEORY
/Common with MSIT 2.1.5/

Instruction: 3 Periods & 1 Tut/week  Sessional Marks: 30
Univ. Exam: 3 Hours  Univ-Exam-Marks: 70

Probability: Definitions of probability, Addition theorem, Conditional probability,
Multiplication theorem, Bayes theorem of probability and Geometric probability.

Random variables and their properties, Discrete Random variable, Continuous Random
variable, Probability Distribution joint probability distributions their properties,
Transformation variables, Mathematical expectations, probability generating functions.

Probability Distributions / Discrete distributions: Binomial, Poisson Negative binominal
distributions and their properties. (Definition, mean, variance, moment generating function.,
Additive properties, fitting of the distribution.)

Continuous distributions: Uniform, Normal, exponential distributions and their properties.

Curve fitting using Principle of Least Squares.

Multivariate Analysis: Correlation, correlation coefficient, Rank correlation, Regression
Analysis, Multiple Regression, Attributes, coefficient of Association, $\chi^2$ – test for goodness
of fit, test for independence.

Sample, populations, statistic, parameter, Sampling distribution, standard error,
unbiasedness, efficiency, Maximum likelihood estimator, notion & interval estimation.

Testing of Hypothesis: Formulation of Null hypothesis, critical region, level of significance,
power of the test.

Small Sample Tests: Testing equality of means, testing equality of variances, test of
correlation coefficient, test for Regression Coefficient.

Large Sample tests: Tests based on normal distribution
Queuing theory: Queue description, characteristics of a queuing model, study state solutions of M/M/1: $\alpha$ Model, M/M/1 ; N Model.

1. Input and Output Characteristics of a BJT in the CE mode.
2. Half Wave and Full Wave rectifiers.
4. Transistor Inverter.
5. Colpitts Oscillator.
7. Astable multivibrator.
8. Self-bias binary.
1. Write a program to implement the operations on stacks.
2. Write a program to implement the operations on circular queues.
3. Write a program for sorting a list using Bubble sort and then apply binary search.
4. Write a program to create a binary search tree and for implementing the in order, preorder, post order traversal using recursion.
5. Write a program for finding the Depth First Search of a graph, and Breadth First Search of a graph.
6. Write a program for converting a given infix expression to postfix form.
7. Write a program for evaluating a given postfix expression.
8. Write a program for implementing the operations of a dequeue.
9. Write a program for the representation of polynomials using circular linked list and for the addition of two such polynomials.
10. Write a program for quick sort.
11. Write a program for Heap sort.
12. Write a program for Merge sort.
13. a) Write a program for finding the transitive closure of a digraph.
   b) Write a program for finding the shortest path from a given source to any vertex in a digraph using Dijkstra’s algorithm.
M.S.(Software Engineering)

SYLLABUS

For

2nd Year

II-Semester

With effect from 2007-08 admitted batch

Chairman
Board of Studies
(2005-08)

Department of Computer Science & Systems Engineering
College of Engineering
Andhra University
Visakhapatnam
# MASTER OF SCIENCE IN SOFTWARE ENGINEERING - M.S.(SE)

**Course Structure and Scheme of Examination**  
**With Effect From 2007-08 Admitted Batch**

2\textsuperscript{nd} year II Semester (Common with M.S.(IT))

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<tr>
<td>MSSE2.2.1</td>
<td>File Structures (Common with MSIT 2.2.1)</td>
<td>3</td>
<td>1</td>
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<tr>
<td>MSSE2.2.2</td>
<td>Operating Systems Principles (Common with MSIT 2.2.2)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>MSSE2.2.3</td>
<td>Computer Organisation (Common with MSIT 2.2.3)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>MSSE2.2.4</td>
<td>Object Oriented Programming (Common with MSIT 2.2.4)</td>
<td>3</td>
<td>1</td>
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<tr>
<td>MSSE2.2.5</td>
<td>Formal Languages &amp; Automata Theory (Common with MSIT 2.2.5)</td>
<td>3</td>
<td>1</td>
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<td>MSSE2.2.6</td>
<td>File Structures Lab (Common with MSIT 2.2.6)</td>
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<td>3 50 50</td>
</tr>
<tr>
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<td>Object Oriented Programming Lab (Common with MSIT 2.2.7)</td>
<td>3</td>
<td>50 50</td>
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<tr>
<td></td>
<td><strong>TOTAL</strong></td>
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</tbody>
</table>

*Common with M.S.(IT)*
Instruction: 3 Periods & 1 Tut/Week Sessional Marks: 30
Univ. Exam: 3 Hours Univ. Exam Marks: 70

File Processing Operations
Physical and logical files, opening, reading & writing and closing files in C, seeking and special characters in files, physical devices and logical files, file-related header files in C

Secondary Storage
Disks – organization, tracks, sectors, blocks, capacity, non-data overhead, cost of a disk access, Magnetic Tape – types, performance, organization estimation of tape length and data transmission times, disk vs tape, CD-ROM – CD-ROM as a file structure, physical organization, strengths and weakness of cd-roms, storage hierarchy

Byte Journey and buffer Management
File manager, I/O buffer, I/O processing, buffer strategies and bottlenecks

File Structure Concepts
A stream file, field structures, reading a stream of fields, record structures and that uses a length indicator, Mixing numbers and characters – use of a hex dump, reading the variable length records from the files

Managing records in C files
Retrieving records by keys, sequential search, direct access, choosing a record structure and record length, header records, file access and file organization

Organizing files for performance
Data compression, reclaiming space – record deletion and storage compaction, deleting fixed-length records for reclaiming space dynamically, deleting variable-length records, space fragmentation, replacement strategies.

Indexing
Index, A simple index with an entry sequenced file, basic operations on an indexed, entry sequenced file, indexes that are too large to hold in memory, indexing to provide access by multiple keys, retrieval using combination of secondary keys, improving the secondary index structure – inverted lists

Indexed sequential file access and prefix B’ Trees
Indexed sequential access, maintaining a sequence set, adding a simple index to the sequence set, the content of the index: separators instead of keys, the simple prefix B’ tree,
simple prefix B⁺ tree maintenance, index set block size, internal set block size, internal structure of index set blocks: a variable order B-tree, loading a simple prefix B⁺ tree

**Special Note:** Implementation in C only

**Hashing**
Collisions in hashing, a simple hashing algorithms, hashing functions and record distributions, memory requirements, collision resolution by progressive overflow, buckets, deletions

**Extendable hashing**
Working of extendable hashing, implementation, deletion, extendable hashing performance

**Designing file structure for CD-ROM**
Tree structure on CD-ROM, hashing files on CD-ROM, CD-ROM file structure

**Text Book:** File Structures – An Object Oriented Approach with C++ by Michael J. Folk, Bill Zoellick and Greg Riccardi, Pearson

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**MSSE 2.2.2 OPERATING SYSTEMS PRINCIPLES**
(Common with MSIT 2.2.2)

**Instruction:** 3 Periods & 1 Week./Week  
**Sessional Marks:** 30  
**Univ_ Exam:** 3 Hours  
**Univ_ Exam Marks:** 70

**Introduction:** What IS OS; History of Operating Systems, Operating System Concepts, Operating Systems Structure

**Processes:** Introduction to Processes, Inter Processor Communication, Classical IPC Problems, Process Scheduling

**Memory Management:** Memory Management without Swapping or Paging, Swapping, Virtual Memory, Page Replacement Algorithms, Modeling paging algorithms, Design issues for paging systems, Segmentation

**File Systems And Input/Output:** Files, Directories, File system implementation, Security, Protection mechanism, Principles of I/O Software, Disk Management

**Deadlocks:** Resources, Deadlocks, The O-----ptical Algorithm, Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention, Other Issues

**Case Study:** Unix: Fundamental Concepts in Unix, MS – DOS: Fundamental Concepts in MS-DOS
**Text Book:** Modern Operating Systems by Andrew S. Tanenbaum

**Reference:** Applied Operating Systems Concepts by Avi Silberschatz, Peter Galvin, Grey Gagne
MSSE 2.2.3 COMPUTER ORGANIZATION  
(Common with MSIT 2.2.3)

Instruction: 3 Periods & 1 Tut /week  Sessional Marks: 30

Univ-Exam : 3 Hours  Univ-Exam Marks:70

Register Transfer and Micro operations:
Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

Basic Computer Organization and Design:
Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt, Complete Computer Description.

Microprogrammed Control:
Control Memory, Address Sequencing, Micro program Example.

Central Processing Unit:
Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control.

Computer Arithmetic:
Introduction, Addition and Subtraction, Decimal Arithmetic Unit.

Input-Output Organization:
Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access.

Memory Organization:
Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Text Book:

Reference Book:
MSSE 2.2.4  OBJECT ORIENTED PROGRAMMING
(Common with MSIT 2..2.4)

Instruction:  3 Periods & 1 Tut /week                        Sessional Marks: 30
Univ-Exam :  3 Hours     Univ-Exam Marks:70

1. Procedural Paradigms, Object Oriented Paradigm, Concept of Data Abstraction
   Encapsulation, Inheritance and Polymorphism
2. Introduction to U.M.L : Description of various U.M.L. Diagrams with examples.

C++
3. Basics of Object Oriented Programming : benefits of OOP, data types, declarations,
   expressions and operator precedence, functions, scope of variables
4. Introduction to OOP : Classes and objects, Constructors & Destructors, Operator
   Overloading & type conversions.
5. Inheritance : Derived classes, syntax of derived classes, making private members
   inheritable, single, multilevel, multiple, hierarchical, hybrid inheritance
6. Polymorphism: Pointers, virtual functions and polymorphism- pointers to objects, this
   pointer, pointers to derived classes, virtual and pure virtual functions.
7. Templates, Exception handling, console I/O and File I/O: class templates, Function
   templates, member function templates, exception handling, managing console I/O
   operations, working with files.

JAVA
8. Introduction to JAVA: Introduction, Classes and Objects, Arrays, strings and Vectors,
   Exception Handling, Managing I/O files in Java.
9. Packages and Interface, and Multi threading: Packages, Interfaces, creating,
   extending, stopping, blocking threads, thread states, thread methods, exceptions, priority
   in threads, synchronization, Runnable interface.

Text Books:
1. JAVA 2.0- Complete Reference : Herbert Schildt & F. Naughton.
2. Introduction to JAVA PROGRAMMING by Y.Daniel Liang (PHI)
3. Object oriented Programming using C++: E. Balagurusamy, PHI.
4. Programming with JAVA- A primer: E. Balagurusamy, PHI
5. The Unified Modeling Languages user Guide by Grady Booch Etal.(Pearson
   Education)

References:
6. Object Oriented Programming in C++: N. Barkakati, PHI
7. Object Oriented Programming through C++ by Robat Laphore.
8. Object Oriented Analysis and Design by Andrew Haigh – (Tata Mcgrah Hjill.)
MSSE 2.2.5  FORMAL LANGUAGES AND AUTOMATA THEORY
(Common with MSIT 2.2.5)

Instruction: 3 Periods & 1Tut/Week            Sessional Marks: 30
Univ_Exam: 3 Hours                          Univ_Exam Marks: 70

1. Finite Automata and Regular Expressions:
Basic Concepts of Finite State Systems, Deterministic and Non-Deterministic Finite
Automata, Finite Automata with e-moves, Regular Expressions, Minimization of Finite
Automata, Mealy and Moore Machines, Two-Way Finite Automate.

2. Regular sets & Regular Grammars:
Basic Definitions of Formal Languages and Grammars, Regular Sets and Regular
Grammars, Closure Properties of Regular Sets, Pumping Lemma for Regular Sets, Decision
Algorithm for Regular Sets, Myhill-Nerode Theorem, Minimization of Finite Automata.

3. Context Free Grammars and Languages:
Context Free Grammars and Languages, Derivation Trees, Simplification of Context Free
Grammars, Normal Forms, Pumping Lemma for CFL, closure properties of CFL’s,
Decision Algorithm for CFL.

4. Push down Automata and Deterministic CFL:
Informal Description, Definitions, Push-Down Automata and Context free Languages,
Parsing and Push-Down Automata.

5. Universal Turing Machines and Undecidability:
Design and Techniques for Construction of Turing Machines, Undecidability of PCP.
Chomsky Hierarchy, Regular Grammars, Unrestricted Grammars, Context Sensitive
languages, Relationship between classes of languages.

TEXT BOOKS: Introduction to Automata Theory,
Languages & Computation By J.E.Hopcraft & Jeffery

REFERENCE BOOKS:
Theory of Computer Science By Mishra & Chandra
Sekharan, PHI.
An Introduction To Formal Languages and Automata,3e By Peter Linz – Narosa
Publishing House.
MSSE 2.2.6  FILE STRUCTURES LAB
(Common with MSIT 2.2.6)

Practical :  3 Periods /Week  Sessional Marks :  50
Univ-Exam : 3 Hours  Univ-Exam Marks:100

1. **File Operations:**
   - Opening, reading, writing, closing and creating of files in C++

2. **Study of secondary storage devices:**
   - Tracks, sectors, block capacity of disk, tape and CDROMs

3. **File Structures in C++**
   - Reading a stream of fields, record structures and its length indicators, Mixing of numbers and characters, Use of a hex dump, Retrieving records by keys using sequential search, direct access

4. **File performance**
   - Data compression, storage compacting, reclaiming space dynamically

5. **Indexing and indexed sequential files**
   - Index file, inverted file operations, usage of B and B++ trees

6. **Hashing files**
   - Hashing functions, algorithms, record distribution and collision resolution by progressive over flow, Extendable hashing and hashing performance
MSSE 2.2.7 OBJECT ORIENTED PROGRAMMING LAB.
(Common with MSIT 2.2.7)

Lab: 3 periods/week Sessional Marks: 50
Univ_Exam: 3 hours. Univ_Exam marks: 50

C++
1. Program that implements stack operations using classes and objects.
2. Program performing complex number addition using friend functions.
3. Program for complex number addition using operator overloading.
4. Program to perform string operations by overloading operators.
5. Program on hierarchical inheritance showing public, private and protected inheritances.
6. Program for computation of students result using hybrid inheritance.
7. Program implementing bubble-sort using templates.
8. Program on virtual functions.
10. Program for copying one file to another file using streams.
11. Program for writing and reading a class object to a file.

JAVA
1. Program on packages.
2. Write a program to copy contents of a file into another file using File streams.
3. Program on hierarchical inheritance.
4. Program for handling ArrayIndexOutOfBoundsException and Divide-by-zero Exception.
5. Program for custom exception creation.
6. Program on multi-threading showing how CPU time is shared among all the threads.
8. Program for BannerApplet.
10. Program for implementing mouse events, (drawing lines, curves using mouse etc.,)
11. Program on JDBC connectivity where database is Oracle.
12. Program to send messages across two machines using simple sockets.
### Course Structure and Scheme of Examination

**With Effect From 2007-08 Admitted Batch**

#### 3rd year I Semester (Common with M.S.(IT) )

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<th>Sub. Ref. No.</th>
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<td>Lab</td>
</tr>
<tr>
<td>MSSE 3.1.1</td>
<td>Operating Systems Internals (Common with MSIT3.1.1)</td>
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<td>MSSE 3.1.2</td>
<td>Microprocessors (Common with MSIT3.1.2)</td>
<td>3</td>
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<td>MSSE 3.1.3</td>
<td>Database Management Systems (Common with MSIT3.1.3)</td>
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<td>MSSE 3.1.4</td>
<td>Computer Networks (Common with MSIT3.1.4)</td>
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<td>Theory of Programming Languages (Common with MSIT3.1.5)</td>
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<tr>
<td>MSSE 3.1.6</td>
<td>Operating Systems Lab (Common with MSIT3.1.6)</td>
<td>3</td>
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<td>MSSE 3.1.7</td>
<td>Computer Organisation Lab (Common with MSIT3.1.7)</td>
<td>3</td>
<td>50</td>
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**TOTAL** 700 24

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**SCHEME OF VALUATION**

**IS SAME AS**

**UG COURSES OF ANDHRA UNIVERSITY COLLEGE OF ENGINEERING**
MSSE 3.1.1                OPERATING SYSTEMS INTERNALS
(Common with MSIT 3.1.2)

Instruction:  3 Periods & 1Tut./Week      Sessional Marks:  30
Univ_Exam: 3 Hours                             Univ_ Exam Marks:70

**Introduction**: What IS OS; History of Operating Systems, Operating System Concepts, Operating Systems Structure

**Processes**: Introduction to Processes, Inter Processor Communication, Classical IPC Problems, Process Scheduling

**Memory Management**: Memory Management without Swapping or Paging, Swapping, Virtual Memory, Page Replacement Algorithms, Modeling paging algorithms, Design issues for paging systems, Segmentation

**File Systems And Input/Output**: Files, Directories, File system implementation, Security, Protection mechanism, Principles of I/O Software, Disk Management

**Deadlocks**: Resources, Deadlocks, The Optimal Algorithm, Deadlock Detection and Recovery, Deadlock Avoidance, Deadlock Prevention, Other Issues

**Case Study**: Unix: Fundamental Concepts in Unix, MS – DOS: Fundamental Concepts in MS-DOS

**Text Book**: Modern Operating Systems by Andrew S. Tanenbaum

MSSE 3.1.2 MICROPROCESSORS
(Common with MSIT 3.1.2)

Instruction: 3 Periods & 1Tut./Week
Univ_Exam: 3 Hours

Sessional Marks: 30
Univ_ Exam Marks: 70

The 8085A µP. Architecture and Instruction Set:
Introduction to Microprocessors and Microcomputers, Internal Architecture and Functional/Signal
Description of typical 8-bit µP.- 8085, Instruction Set and Timing Diagrams of 8085 µP.

Programming the 8085 µP.:
Assembly Language Programming Requirements, Programming Techniques: Looping, Counting, and Indexing, Counter and timing Delays, Stack and Subroutines, Code Conversion, BCD Arithmetic, 16-bit data Operations, Interrupts and Interrupt Service Routines

The 8086 µP. Architecture and Instruction Set:
Internal Architecture and Functional/Signal Description of 8086/8088
Segmented Memory, Maximum-Mode and Minimum-Mode Operation, Addressing Modes, Instruction Set and Timing Diagrams

Programming the 8086 µP.:
Assembly Language Requirements, Data Definition, COM and EXE program Files
Programming techniques: Logical Processing, Arithmetic processing, Time Delay Loops Procedures, Data tables, Modular programming, and Macros

An overview of Advanced Microprocessors: 80286,80386,80486, Pentium Processors

TEXT BOOKS:

REFERENCE BOOK:
MSSE 3.1.3 DATABASE MANAGEMENT SYSTEMS
(Common with MSIT 3.1.3)

Instruction: 3 Periods & 1Tut./Week Sessional Marks: 30
Univ_Exam: 3 Hours Univ_ Exam Marks:70

Introduction to DBMS: Overview, File system vs DBMS, Advantages of DBMS, Storage data, queries, Transaction Management, DBMS structure

E-R model: Entities, Attributes and Entity sets, Relationship and Relationship sets, Features of ER model, Conceptual database design with ER model

Relational model: Integrity constraints over relations and enforcement, Querying relation data, Logical database design, views, destroying/altering tables and views

Relational Languages: algebra and calculus

SQL: Basic SQL, Query, union, interest, except, Nested Queries, Aggregated Operation, Null values, Embedded SQL, cursors, ODBC and JDBC, Triggers and Active database, designing active databases

Schema refinement and normal forms: Schema refinement, fds, reasoning normal forms, normalization up to 3rd & BC normal forms, lossless join & dependency preserving decomposition

Transaction management: Transaction concept, transactions and schedules, concurrent execution of transactions, lock – based concurrency control, crash recovery

Concurrency control: Lock management, specialized locking techniques, concurrency control without locking

Crash Recovery: Aries, recovering from a system crash, media recovery

Text Book:
Database Management Systems by Raghu Ramakrishnan and Johannes Gehrke, McGraw-Hill
MSSE 3.1.4 COMPUTER NETWORKS
(Common with MSIT 3.1.3)

Instruction: 3 Periods & 1Tut./Week Sessional Marks: 30
Univ_Exam: 3 Hours Univ_ Exam Marks: 70

1. Introduction:
   Data communications, Networks, The Internet, Protocol & Standards
2. Network Models:
   Layered tasks, Internet model, OSI model
3. Physical layer:
   3.1 Signals: Analog and digital signals, data rate limits, Transmission impairment,
   Signal measurements like throughput, propagation speed and time, wave length
   3.2 Digital Transmission: Line coding, block coding, sampling, transmission mode
   3.3 Analog Transmission: Modulation digital data, telephone modem, Modulation analog signals
   3.4 Multiplexing: FDM, WDM, TDM
   3.5 Transmission Media: Guided media, unguided media
   3.6 Circuit Switching & Telephone Network: Circuit switching, telephone network
4. Data Link Layer:
   4.1 Error detection and Correction: Type of errors, detection and correction of errors
   4.2 Data Link Control & Protocol: Flow & error control, Stop-And-Wait ARQ, Go-Back-N ARQ, Select Repeat ARQ, HDLC
   4.3 Point-To-Point Access: Point-to-point protocol, PPP stack
   4.4 Local Area Network: Traditional Ethernet, fast and gigabit Ethernet
   4.5 Connecting LANs, Backbone Networks and Virtual LANs: Connecting devices, Backbone networks, Virtual LANs
5. Network Layer:
   5.1 Internetworks, Addressing, Routing
   5.2 Network Layer Protocols: ARP, IP, ICMP, IPV6
   5.3 Unicast routing, Unicast routing protocols, Multi routing, Multicast routing protocols
6. Transport Layer:
   6.1 Process-To-Process delivery, user data gram, Transmission control protocol
7. Application Layer:
   7.1 Client-Server Model: Client-Server model, Socket interface
   7.2 A brief introduction to DNS, SMTP, FTP

Text Book:
Reference Book:
1. The Role of Programming Languages: Toward Higher-level Languages, Problems of Scale, Programming Paradigms, Language Implementation Bridging the Gap
7. Object-Oriented Programming: What is an Object?, Object-Oriented Thinking, Inheritance, Object-Oriented Programming in C++, An extended C++ example, Derived Classes and information Hiding, Objects in Smalltalk, Smalltalk Objects have self.

Text Book: Programming Languages – Concepts & Constructs, Ravi Sethi, Pearson Education. References:
1. Programming Languages – Design & Implementation, Terrance W. Pratt, Marvin V. Zelkowitz, Pearson Education.
2. Concepts of Programming Languages – Robert L. Sebesta, Pearson Education
MSSE 3.1.6          OPERATING SYSTEMS LAB
(Common with MSIT 2.2.6)

Practical :  3 Periods /Week                      Sessional Marks :   50
Univ-Exam :  3 Hours                                    Univ-Exam Marks: 50

1. Study of laboratory environment:
   Hardware specifications, software specifications
2. Simple Unix-C programs:
   Programs using system calls, library function calls to display and write strings on
   standard output device and files.
3. Programs using fork system calls.
2. Programs for error reporting using errno, perror( ) function.
3. Programs using pipes.
4. Shell programming.
5. Programs to simulate process scheduling like FCFS, Shortest Job First and Round
   Robin.
6. Programs to simulate page replacement algorithms like FIFO, Optimal and LRU.
7. Programs to simulate free space management.
8. Programs to simulate virtual memory.
10. Programs to simulate deadlock detection.

References:
1. Unix Systems Programming : Communication, Concurrency and Threads, Kay
   Robbins, 2-Edition, Pearson Education
2. Unix concepts and applications, Sumitabha Das, TMH Publications.
3. Unix programming, Stevens, Pearson Education.
4. Shell programming, Yashwanth Kanetkar.
MSSE 3.1.7       COMPUTER ORGANIZATION LAB
(Common with MSIT 2.2.6)

Practical : 3 Periods /Week                Sessional Marks :  50
Univ-Exam : 3 Hours                       Univ-Exam Marks: 100

Digital Logic Design Experiments :

1. TTL Characteristics and TTL IC Gates
2. Multiplexers & Decoders
3. Flip-Flops
4. Counters
5. Shift Registers
6. Binary Adders & Subtractors
7. A L U

Assembly Language Programming :

1. 8085 Assembly Language Programming according to theory course microprocessors-I using the following trainers :
   - Keyboard Monitor of 8085μP Trainer.
   - Serial Monitor of 8085μP Trainer with Terminal
   - 8085 Line Assembler of 8085μP Trainer with PC as Terminal
   - 8085 Cross Assembler using In-Circuit Emulator (ICE) with 8085μP Trainer and PC as Terminal

2. 8086 Assembly Language Programming according to theory course Microprocessor-I using the following :
   - PC Assembler using TASM or MASM, TD or SYMDEB or CVD(Code View debugger)

Graded Problems are to be used according to the syllabus of MICROPROCESSORS-I
M.S. (SOFTWARE ENGINEERING)

COURSE STRUCTURE AND SCHEME OF EXAMINATION

For

3rd Year

II-Semester

With effect from 2007-08 admitted batch

Chairman
Board of Studies
(2005-08)

Department of Computer Science & Systems Engineering
College of Engineering
Andhra University
Visakhapatnam
### Course Structure and Scheme of Examination
**With Effect From 2007-08 Admitted Batch**

#### 3rd year II Semester (Common with M.S.(IT) )

<table>
<thead>
<tr>
<th>Sub. Ref. No.</th>
<th>Name of the Subject</th>
<th>Periods</th>
<th>Max. Marks</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Tutorial</td>
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<tr>
<td>MSSE 3.2.1</td>
<td>Unified Modeling Language (Common with MSIT3.2.1)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>MSSE 3.2.2</td>
<td>Computer Graphics and Visualisation (Common with MSIT3.2.2)</td>
<td>3</td>
<td>1</td>
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<tr>
<td>MSSE 3.2.3</td>
<td>Systems Programming (Common with MSIT3.2.3)</td>
<td>3</td>
<td>1</td>
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<tr>
<td>MSSE 3.2.4</td>
<td>Internet and Intranet Engineering (Common with MSIT3.2.4)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>MSSE 3.2.5</td>
<td>Elective II 1. Device Interfacing 2. Distributed Operating Systems (Common with MSIT3.2.5)</td>
<td>3</td>
<td>1</td>
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<tr>
<td>MSSE 3.2.6</td>
<td>Database Management Systems Lab (Common with MSIT3.2.6)</td>
<td>3</td>
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<tr>
<td>MSSE 3.2.7</td>
<td>Computer Networks Lab (Common with MSIT3.2.7)</td>
<td>3</td>
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**TOTAL** 700 24

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**SCHEME OF VALUATION**

IS SAME AS

**UG COURSES OF ANDHRA UNIVERSITY COLLEGE OF ENGINEERING**
MSSE 3.2.1 UNIFIED MODELING LANGUAGE
(Common with MSIT 3.1.1)

Instruction: 3 Periods & 1Tut./Week  Sessional Marks: 30
Univ_Exam: 3 Hours  Univ_ Exam Marks: 70

Why We Model, The Importance of Modeling, Principles of Modeling, Object-Oriented Modeling, Introducing the UML, an Overview of the UML, a Conceptual Model of the UML, Architecture Software Development Life Cycle, Key Abstractions, Mechanisms, Artifacts.


Interfaces, Types, and Roles, Terms and Concepts, Common Modeling Techniques.


Basic Behavioral Modeling, Interactions, Terms and Concepts, Common Modeling Techniques,


Authors: Grady Booch, James Rumbaugh and Ivar Jacobson
Publisher: Pearson Education
MSSE 3.2.2 COMPUTER GRAPHICS AND VISUALIZATION
(Common with MSIT 3.1.1)

Instruction: 3 Periods & 1Tut./Week                  Sessional Marks: 30
Univ_Exam: 3 Hours            Univ_ Exam Marks:70

Introduction: Usage of Graphics and their applications, Presentation Graphics-
Computer Aided Design- Computer Art- Entertainment- Education and Training-
Visualization- Image Processing- Graphical User Interfaces

Over view of Graphics systems: Video Display Devices- Raster Scan systems-random
scan systems-Graphics monitors and workstations-Input devices-hard copy devices-
Graphics software

Output primitives: Points and Lines-Line Drawing Algorithms- Loading the Frame
buffer- Line function- Circle- Generating Algorithms- Ellipse Generating Algorithms-
Other Curves- Parallel Curve Algorithms-Curve Functions-Pixel Addressing- Filled Area
Primitives-Filled Area Functions- Cell Array- Character Generation

Attributes of Output Primitives: Line and Curve Attributes-Color and Gray scale
levels- Area Fill Attributes- Character Attributes-Bundled Attributes- Inquiry Functions-
Antialiasing

Two Dimensional Geometric Transformations: Basic Transformations- Matrix
Representations-Homogeneous Coordinates-Composite Transformations-Other
Transformations-Transformations between Coordinate Systems- Affine Transformations-
Transformation Functions- Raster methods for Transformations

Two Dimensional Viewing: The viewing Pipeline-Viewing Coordinate Reference
Frame-Window-to-Viewport Coordinate Transformation-Two Dimensional Viewing
Functions-Clipping Operations-Point Clipping-Line Clipping-Polygon Clipping-Curve
Clipping- Text and Exterior Clipping

Structure And Hierarchical Modeling: Concepts of Structures and Basic models-
Editing - Hierarchical Modeling with Structures-GUI and Interactive Input Methods-
Windows and Icons- Virtual Reality Environments

Three Dimensional Concepts and Object representations: 3D display methods-3D
Graphics-Polygon Surfaces- Curved Lines and Surfaces- Quadratic Surfaces-Super
Quadrics-Blobby Objects-Spline Representations- Cubic Spline methods-Bézier Curves
and Surfaces- B Spline Curves and Surfaces

Three Dimensional Geometric and Modeling Transformations: Translation-
Rotation-scaling-Other Transformations-Composite Transformations-3D Transformation
Functions-Modeling and Coordinate Transformations

Three Dimensional Viewing: Viewing Pipeline- Viewing Coordinates- Projections-
View Volumes- General Projection Transformations-Clipping-Hardware
Implementations- Three Dimensional Viewing

Chapters 1 to 12 except 10-9 to 10-22 of the Text book

Text Book: Computer Graphics C Version by Donald Hearn & M. Pauline Baker
Pearson Education, New Delhi, 2004

Reference Books:
Book Company, New Delhi, 2003
Dam  F. H John, Pearson Education, 2004
MSSE 3.2.3 SYSTEMS PROGRAMMING
(Common with MSIT 3.1.1)

Instruction: 3 Periods & 1Tut./Week Sessional Marks: 30
Univ_Exam: 3 Hours Univ_Exam Marks: 70

Introduction to Systems Programming, Introduction to Assembly Language Programming -
Introduction to Instruction Formats, Data formats - Role of Base Register, Index Register.

Introduction to Assembler, databases used in assembler design, Design of Assembler - Single
Pass & Double Pass.

Introduction to Macros, various types of Macros, Design of Macro Processor - Single Pass &
Double Pass. Introduction to Loaders, functions of a loader, types of Loaders, databases used in
Loaders, Design of Loaders - Absolute & DLL.

Introduction to Software Tools, Text editors, Interpreters, Program Generators, Debug Monitors.

TextBook: Systems Programming by Donovan
Tata Mc Graw Hill

MSSE 3.2.4  INTERNET AND INTRANET ENGINEERING
(Common with MSIT 3.1.1)

Instruction: 3 Periods & 1Tut./Week  Sessional Marks: 30
Univ_Exam: 3 Hours  Univ_ Exam Marks:70

1. INTRODUCTION: The Internet/Intranet landscape,
The Internet: A Short Retrospective;
The TCP/IP Standardization Approach to Internet and Intranets,
Network Topologies for Intranets
Internet Protocol Model Overview
Internet Addresses: Foundations for Internet and Intranets
Internet Protocol: Basis for Internet and Intranets
Internet Access
Internet Applications

2. ROUTER TECHNOLOGY

3. INTERNET AND INTRANET WEB SERVER TECHNOLOGY, ACCESS AND PROTOCOLS

4. HTML TECHNOLOGY, APPLICATIONS, AND EXAMPLES:
Introduction, The Nuts and Bolts of HTML
Practical Considerations for internet/Intranet pages.

5. ON-LINE SERVICES

6. BROADBAND COMMUNICATIONS FOR THE INTERNET AND INTRANETS


Douglas E Comer, Computer Networks and internet, 2/e, Pearson Education, 2005
Interfacing Semiconductor Memories:
Semiconductor Memories: Classification, Internal Organisation & Functional Description. Interfacing SRAMs, and EPROMs to 8085/8086

Interfacing I/O Devices:

Interfacing Peripheral ICs to Intel 8085/8086:
Parallel I/O Interface - 8255, Serial I/O Interface – 8251, Timer Interface - 8253, Keyboard/Display Interface - 8279, Interrupt Controller Interface - 8259

Interfacing Data Converters to 8085/8086:
D/A Conversion Methods, A/D Conversion methods, Interfacing DAC, Interfacing ADC.

Introduction to Micro controllers:
Intel 8051 Architecture and Programming

Introduction to Hardware and Software of PCs:
Hardware Organization, DOS Internals, ROM BIOS and BIOS Function Calls, DOS Function Calls, Introduction to Pentium Processors

TEXT BOOKS:

REFERENCE BOOKS:
5. Myke Predko, Programming and Customizing the 8051 Microcontroller, TMH, 1999
Introduction to Distributed Systems, What is a Distributed System?, Hardware concepts, Software concepts, Design issues.


Synchronization in Distributed System, Clock Synchronization, Mutual Exclusion, Election algorithms, Atomic transactions, Deadlocks in Distributed Systems.

Process and processors in Distributed System threads, System Models, Processors allocation, Scheduling in Distributed System, Fault tolerance, Real-time Distributed System.


Distributed Shared Memory, Introduction, What is Shared memory?, Consistency models, Page based Distributed Shared memory, Shared – variable Distributed Shared memory, Object-based Distributed Shared Memory.

TEXT BOOK:
Distributed Operating Systems, Andrew S. Tanenbaum

Reference Book:
Study features of a commercial RDBMS package such as ORACLE/DB2, MS Access, MYSQL & Structured Query Language (SQL) used with the RDBMS. (Select two of RDMSs)

Laboratory exercises should include defining schemas for applications, creation of a database, writing SQL queries, to retrieve information from the database, use of host languages, interface with the embedded SQL, use of forms & report writing packages available with the chosen RDBMS product.

Some sample applications, which may be programmed, are given below: Accounting package for a shop, Database manager for a Magazine agency or a newspaper agency, Ticket booking for performances, Preparing greeting cards & birthday cards, Personal accounts - Insurance, loans, mortgage payments, etc., Doctor's diary & billing system, Personal bank account, Class marks management, Hostel accounting, Video Tape library, History of cricket scores, Cable TV transmission program manager, Personal library.
1. Identifying well known ports on a Remote System:
   By trying to listen to the various well known ports by opening client connections. If the
   exception does not occur then the remote port is active else the remote port is inactive.
2. Writing a Chat application:
   i). One-One: By opening socket connection and displaying what is written by one party to the
      other.
   ii). Many-Many (Broadcast): Each client opens a socket connection to the chat server and writes
       to the socket. Whatever is written by one party can be seen by all other parties.
3. Data retrieval from a Remote database:
   At the remote database a server listens for client connections. This server accepts SQL queries
   from the client, executes it on the database and sends the response to the client.
4. Mail Client:
   i). POP Client: Gives the server name, user name and password retrieve the mails and allow
       manipulation of mail box using POP commands.
   ii). SMTP Client: Gives the server name, send e-mail to the recipient using SMTP commands-
       (Core Java 2 pg:163.)
5. Simulation of Telnet:
   Provide a user interface to contact well-known ports, so that client-server interaction can be seen
   by the user.
6. Simple file transfer between two systems (without protocols):
   By opening socket connection to our server on one system and sending a file from one system to
   another.
7. TFTP-Client:
   To develop a TFTP client for file transfer. (Unix Network Programming- Stevens.)
8. HTTP-Server:
   Develop a HTTP server to implement the following commands.
   GET, POST, HEAD, DELETE.
   The server must handle multiple clients.

Reference Books:
1. Java Network Programming, Harold Orielly
2. An Introduction to Computer Networking,
   Kenneth C. Mansfield Jr and James L. Antonakos
   Pearson Education Asia