Master of Computer Applications

FIFTH SEMESTER EXAMINATION

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* Non-University Examination System (NUES)
OBJECTIVES: The main objective of this course is to provide Students
- A comprehensive overview of the Linux operating system along with Shell commands and shell scripting
- Implementation of Linux System programmes through GCC compiler.
- Understanding of basic concept of Socket programming (TCP and UDP)

PRE-REQUEISTE:
- Operating system
- Computer Network
- C /C++ Programming

UNIT – I
[No. of Hrs.: 10]

UNIT – II
Resource Management in Linux: file and directory management, system calls for files Process Management, Signals, IPC: Pipes, FIFOs, System V IPC, Message Queues, system calls for processes, Memory Management, library and system calls for memory.  
[No. of Hrs.: 10]

UNIT – III
Shell Programming:Available shells under Linux (viz. Bash, TCSH, Korn or so on), different Shell features, editors, shell commands, shell scripts: shell variables, environmental variables, purpose of shell scripts, writing, storing and executing scripts, Filters- The grep family, advanced filters-sed and awk.  
[No. of Hrs.: 10]

UNIT – IV
[No. of Hrs.: 10]

TEXT BOOKS:
REFERENCES:
11. Tammy Fox, “Red Hat Enterprise Linux 5.0 Administrator Unleashed”, SAMS.
OBJECTIVE: At the end of this course the student will be able to:

- Appreciate the fundamentals of software testing and its application through the software life cycle.
- Develop skills in designing and executing software tests suitable for different stages in the software life cycle.
- Understand and appreciate the role of software testing in systems development, deployment and maintenance.
- Develop a continuing interest in software testing, and obtain satisfaction from its study and practice.
- Appreciate the responsibilities of software testers within software projects, the profession and the wider community.

PRE-REQUISITE:
- Software Engineering Concepts

UNIT - I

[No. of Hrs.: 08]

UNIT - II
Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

[No. of Hrs.: 10]

UNIT - III
Selection, Minimization, Prioritization of test cases for Regression Testing: Regression Testing, Regression Test Case Selection, Prioritization guidelines, Priority category Scheme, Code Coverage Techniques for Prioritization of Test Cases, Risk Analysis.

[No. of Hrs.: 12]

UNIT - IV
**Object Oriented Testing**: Issues in Object Oriented Testing, Path testing, Class Testing, state based testing, Object Oriented Integration and System Testing.

**Metrics and Models in Software Testing**: What are Software Metrics, categories of Metrics, object Oriented Metrics used in testing, What should we measure during testing?, Software Quality Attributes.

**Prediction Model**: Reliability Modes, Fault Prediction Model. [No. of Hrs.: 12]

**TEXT BOOKS:**

**REFERENCES:**
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. There should be 10 questions of short answer type of 2 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks including subparts, if any.

OBJECTIVE: In this course student will learn about J2EE technology and will be able to develop dynamic websites. This course will explain how Enterprise JavaBeans (EJBs) contain the application's business logic and business data.

PRE-REQUISITES:
- Core JAVA

UNIT I
Introduction to J2EE and building J2EE applications, MVC architecture, Introduction to servlets and its life cycle, problems with cgi-perl interface, generic and http servlet, servlet configuration, various session tracking techniques, servlet context, servlet configuration, servlet collaboration.

[No. of Hrs. : 10 Hrs]

UNIT II
JSP Basics and Architecture: JSP directives, Scripting elements, standard actions, implicit objects, jsp design strategies.
Struts: Introduction of Struts and its architecture, advantages and application of Struts.

[No. of Hrs. : 12 Hrs]

UNIT III
EJB fundamentals: Motivation for EJB, EJB Echo system, J2EE technologies, Enterprise beans and types, distributed objects and middleware, developing EJB components, remote local and home interface, bean class and deployment descriptor.

[No. of Hrs.: 10 Hrs]

UNIT IV
Introducing session beans: Session beans life time, statefull and Stateless session beans beans, lifecycle of session beans.
Introducing Entity beans: persistence concepts, features of entity beans, entity context, Introduction to JMS & Message driven beans.

[No. of Hrs. : 10 Hrs]

TEXT BOOKS:
REFERENCES:
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OBJECTIVES: This course is an attempt to provide you with the advanced information about database management system and their development. This course also provides the conceptual background necessary to design and develop distributed database system for real life applications.

PRE-REQUISITE:
- Centralized Database Management System Concepts

UNIT -I
Review of traditional DBMS’s, relational algebra and relational calculus, design principles, normalization, transaction and concurrency control, recovery management. [No. of Hrs.: 10]

UNIT -II
Design Process: Design process, design evaluation, modeling process, E-R model, and semantic data model, object oriented model, models and mapping normalization and denormalization. Data warehousing, OLAP and data mining. [No. of Hrs.: 12]

UNIT -III
Architecture: Architecture of SQL server, SQL server and Oracle server tuning, SQL server tuning, Oracle server tuning, OS tuning (Microsoft OS’s). [No. of Hrs.; 08]

UNIT-IV
Distributed Database Management Systems, Components, levels of data & process distribution, transparency features, data fragmentation, data replication, Client Server Systems, Principles, components, ODBC, ADO, JDBC and JSQL overview. [No. of Hrs.: 12]

TEXT BOOKS:
1. C. J. Date, “Introduction to Database Systems”, AWL.

REFERENCES:
1. DB2, Oracle & SQL Server Documentation.
OBJECTIVES: This course responds to the needs of the engineering and physical sciences curricula by providing an applications-oriented introduction to numerical methods/analysis. Rather than a pure discussion and analysis of methods, we shall often integrate a discussion of the properties of engineering and physical problems with the discussion of methods by which such problems may be solved numerically. This approach is more “natural” and more like the one students actually follow when applying numerical methods within their areas of interest.

PRE-REQUISITE:
- Basic of Mathematics

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

[No. of Hrs.: 10]

TEXT BOOKS:

REFERENCES:
5. Francis Scheld, “Numerical Analysis”, TMH.
INSTRUCTIONS TO PAPER SETTERS:

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OBJECTIVE: Software Project Management provides insight to the importance of careful project management. Topics are presented in the same order that they appear in the progression of actual projects and covers the following concepts.

The course will introduce and develop the concepts that are seen as central to the effective management of software projects.

Basic measurements are presented with examples from real-world projects, which show how a project can be monitored, controlled and assessed.

PRE-REQUISITE:
- Software Engineering Concepts
- Academic Project

UNIT - I
Introduction: Introduction to software project management and control
Whether software projects are different from other types of projects. The scope of project management. The management of project life cycle. Defining effective project objectives where there are multiple stakeholders. Software Tools for Project Management.

Project Planning: Creation of a project plan -step by step approach, The analysis of project characteristics in order to select the best general approach, Plan Execution, Scope Management, Use of Software (Microsoft Project) to Assist in Project Planning Activities. [No. of Hrs.: 10]

UNIT - II
Project Scheduling: Time Management, Project Network Diagram, Critical path Analysis, PERT, Use of Software (Microsoft Project) to Assist in Project Scheduling.


UNIT - III
Project Quality Management: Stages, Quality Planning, Quality Assurance, Quality Control, Quality Standards, Tools and Techniques for Quality Control.


UNIT - IV
Project Risk Management: Common Sources of Risk in IT projects, Risk Identification, Risk Quantification, Risk Response Development and Control.

Project Procurement Management: Procurement Planning, Solicitation, Source Selection, Contract Administration.
Introduction to Project Management Process Groups, Project Controlling and Configuration Management.

[No. of Hrs.: 10]

TEXT BOOKS:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
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OBJECTIVES: As technology advances and hardware and software improves, it becomes much more feasible to integrate multimedia directly into classroom activities and the core curriculum. Understanding why, when, and where multimedia is appropriate and beneficial is the first step toward successful implementation.
- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop their creativity

PRE-REQUISITE:
- Multimedia Application

UNIT – I
[No. of Hrs.: 10]

UNIT – II
Multimedia – making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different algorithms concern to text, audio, video and images etc., Working Exposure on Tools like MAYA.
[No. of Hrs.: 16]

UNIT – III
[No. of Hrs.: 08]

UNIT – IV
[No. of Hrs.: 08]

TEXT BOOKS:
REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
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OBJECTIVE: This course will cover a broad selection of topics in data communications, resource management, network protocols, distributed computing, information management, user interfaces, applications/services, and security. Students will learn the principles of Mobile Computing and its enabling technologies, and explore a young but rich body of exciting ideas, solutions, and paradigm shifts.

PRE-REQUISITE:
- Operating Systems
- Networking
- Distributed Computing.
- Programming skill in C/C++

UNIT - I

[No. of Hrs.: 12]

UNIT – II
Data management issues: mobility, wireless communication and portability, data replication Schemes, basic concept of multihopping, Adaptive Clustering for mobile Network, Multicluster Architecture.

[No. of Hrs.: 10]

UNIT – III
Location Management: Introduction, Location Based Services, Automatically Locating Mobile Users, Locating and Organizing Services, Is Use and future directions, mobile IP, Comparison of TCP wireless.

[No. of Hrs.: 10]

UNIT - IV
Transaction management: Introduction, Data Dissemination, Cache Consistency, Mobile transaction processing, mobile database research directions, Security fault tolerance for mobile N/W.

[No. of Hrs.: 10]

TEXT BOOKS:

REFERENCES:
1. C. K. TOH, “Mobile Adhoc Networks”, TMH.
OBJECTIVE: This course covers the issues and techniques involved in the creation of computer systems that engage in intelligent behaviour. Students will explore problem-solving paradigms, logic and theorem proving, search and control methods, and learning.

Learning outcome of this course is

- Introducing students to the basic concepts and techniques of Artificial Intelligence.
- Learning AI by doing it, i.e. developing skills of using AI algorithms for solving Practical problems.

PRE-REQUISITES:

- Discrete Mathematic
- Analysis of Algorithms

UNIT- I

[No. of Hrs.: 10]

UNIT- II

[No. of Hrs.: 12]

UNIT- III
First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution – Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects.

[No. of Hrs.: 10]

UNIT- IV
[No. of Hrs.: 10]

TEXT BOOK:

REFERENCES:
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OBJECTIVE: The objective of this course is to introduce students to features and technology of microprocessor systems. Gain experience in assembly language programming of microprocessor peripherals and interrupt service routines, as well as data processing tasks. At the end of the course the student should:
- Know basics of microprocessor-based Systems.
- Know basics of assembly language.
- Know the process of compilation from high level language to assembly language to machine language.
- Know interaction between hardware and software, i.e. `interfacing'.

PRE-REQUISITE:
- Digital Systems Fundamentals
- Assembly Language Programming
- Electronics

UNIT – I
Computer Number Systems, Codes, and Digital Devices: Computer Number Systems and Codes, Microprocessor Evolution and Types, the 8086 microprocessor family-overview, 8086 internal architecture, introduction to programming the 8086, addressing modes of 8086.8086 Family Assembly Language Programming: Program Development Steps, Constructing the machine codes for 8086 instructions, writing programs for use with an assembler, assembly language program development tools.
[No. of Hrs.: 10]

UNIT – II
Implementing Standard Program Structures in 8086 Assembly Language: Simple Sequence Programs, Jumps, Flags, and Conditional Jumps, If-Then, if-then-else, and multiple if-then else programs, while-do programs, while-do programs, repeat-until programs, instruction timing and delay loops Strings, Procedures, and macros: the 8086 string instructions, writing and using procedures, writing and using assembler macros 8086 Instruction Descriptions and Assembler Directives.
[No. of Hrs.: 11]

UNIT – III
[No. of Hrs.: 11]

UNIT – IV
Interfacing 8086 with 8255, 8254, 8259, 8253, 8251, 8259, 8279. Brief Introduction to Architecture of 80186, 80286, 80386, 80486, 8087 and Pentium architecture.
[No. of Hrs.: 10]
TEXT BOOKS:

REFERENCES:
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OBJECTIVES: This course develops the mathematical basis for syntax specification and translation and shows how this basis can be used to design and implement compilers? Learning outcomes of this course are:
- To stimulate deeper learning of algorithms and data structures by practicing compiler writing algorithm.
- To develop Skills to use Tools like Lex and YACC in writing scanners and parsers.
- To develop a cross-compiler.

PRE-REQUISITES
- Programming Language
- Theory of Computation
- Design and Analysis of Algorithms
- Computer Organization

UNIT - I
Compiler Structure: Analysis-synthesis model of compilation, various phases of a compiler, tool based approach to compiler construction. Lexical analysis: Interface with input parser and symbol table, token, lexeme and patterns, difficulties in lexical analysis, error reporting and implementation. Regular grammar & language definition, Transition diagrams, design of a typical scanner using LEX or Flex.

[No. of Hrs.: 10]

UNIT - II
Syntax Analysis: Context free grammars, ambiguity, associability, precedence, top down parsing, top down parsing, recursive descent parsing, transformation on the grammars, predictive parsing LL(1) grammar, Nor LL(1) grammar, Bottom up parsing, operator precedence grammars, LR parsers (SLR, LALR, LR), Design of a typical parser using YACCor Bison.

[No. of Hrs.: 10]

UNIT - III
Syntax directed definitions: Inherited and synthesized attributes, dependency graph, evaluation order, bottom up and top down evaluation of attributes, L- and S-attributed definitions. Type checking: type: type system, type expressions, structural and name equivalence of types, type conversion, overloaded function and operators, polymorphic function. Run time system: storage organization, activation tree, activation record, parameter passing symbol table, dynamic storage allocation. Intermediate code generation: intermediate representation, translation of declarations, assignments, Intermediate Code generation for control flow, Boolean expressions and procedure calls, implementation issues.

[No. of Hrs.: 12]
UNIT - IV
Code generation and instruction selection: Issues, basic blocks and flow graphs, register allocation, code generation, DAG representation of programs, code generation from DAGS, peep hole optimization, code generator generators, specification of machine.
Code optimization: source of optimizations, optimization of basic blocks, loops, global dataflow analysis, solution to iterative dataflow equations, code improving transformations, dealing with aliases, data flow analysis of structured flow graphs. [No. of Hrs: 10]

TEXT BOOKS:

REFERENCES:
OBJECTIVES: This course is to equip students with the ability of conceptualization of real life systems in the form of mathematical models. Learning Outcome of this course are:

- Understanding of Principles of model building and basic optimization concepts.
- To Develop skills to deploy these concepts in diverse fields of application in manufacturing /service/ distribution systems.

PRE-REQUISITES:

- Design and Analysis of Algorithms
- Programming Language

UNIT-I

[No. of Hrs: 11]

UNIT-II

[No. of Hrs: 11]

UNIT-III

[No. of Hrs: 10]

UNIT-IV
Queueing systems, Elements of queueing model, role of exponential distribution, birth and death models, steady state measures of performance, single server models ,multiple-server models, machine servicing model, Pollaczek-Khintchine formula, queueing decision models. Multi criteria Decision making, Introduction to Game theory, Zero-sum Game.

[No. of Hrs: 10]

TEXT BOOKS:


REFERENCES:
OBJECTIV: An in-depth study of design and implementation issues in distributed database systems, together with a coverage of Database distribution architectures, Distributed database design, Distributed query processing, Distributed query optimization, Distributed transaction management, Distributed concurrency control, Distributed reliability protocols and Multi-database systems.

PRE-REQUISITE
• Database Management System
• Distributed Systems

UNIT – I
Distributed DBMS features and needs, Reference Architecture, Levels of Distribution Transparency, Replication, Distributed database design – Fragmentation, allocation criteria, Storage mechanisms, Translation of Global Queries / Global Query Optimization, Query Execution and access plan.
[No. of Hrs.: 12]

UNIT – II
Concurrency control – 2 phase locks, distributed deadlocks, time based and quorum based protocols, comparison reliability – non-blocking commitment protocols, Partitioned networks, Check points and Cold starts.
[No. of Hrs.: 10]

UNIT – III
Management of Distributed Transactions – 2 phase unit protocols, Architectural aspects, Node and link failure recoveries, Distributed data dictionary management, Distributed database administration.
[No. of Hrs.: 10]

UNIT – IV
Heterogeneous database-federated database, reference architecture, loosely and tightly coupled, Alternative architectures, Development tasks, operation – global task management, Client server databases – SQL server, Open database connectivity, Constructing an Application.
Advance Database Concept:
Object Oriented Databases Introduction, Advantages and Disadvantages, Spatial Databases, Multimedia Databases, Deductive Databases, Temporal Databases.
[No. of Hrs.: 10]

TEXT BOOKS:
REFERENCES:
OBJECTIVE: Any organization that deals with money or money's worth needs to record every transaction that it enters into. The courses in this product give a complete understanding, right from scratch to preparation and analysis of financial statements. The product is supplemented with a number of interactive exercises, in accordance with the 'learn by doing' approach.

After completing this course you will be conversant with:

- Accounting Concepts.
- Accounting Equation.
- Rules of Accounting.
- Recording the transactions.
- Adjusting & Rectifying the books.
- Preparation of Financial Statements.
- Analyzing Financial Statements.
- Reconciling the books.

PRE-REQUISITE:
- Mathematical Concepts

UNIT - I

Meaning and Scope of Accounting: Need for Accounting, Definition and Functions of Accounting, Book Keeping and Accounting, Is Accounting Science or Art? End User of Accounting Information, Accounting and other Disciplines, Role of Accountant, Branches of Accounting, Difference between Management Accounting and Financial Accounting

Meaning of Accounting Principles: Accounting Concepts, Accounting Conventions, Introduction to Accounting Standards, Systems of Book Keeping, Systems of Accounting

Journalising Transactions: Journal, Rules of Debit and Credit, Compound Journal Entry, Opening Entry

Ledger Posting and Trial Balance: Ledger, Posting, Relationship between Journal and Ledger, Rules Regarding Posting, Trial Balance


Capital and Revenue: Classification of Income, Classification of Expenditure, Classification of Receipts

Rectification of Errors: Classification of Errors, Location of Errors, Suspense Account, Rectifying Accounting Entries, Effect on Profit

[No. of Hrs: 12]

UNIT – II

Depreciation Provisions and Reserves: Concept of Depreciation, Causes of Depreciation, Basic Features of Depreciation, Meaning of Depreciation Accounting, Objectives of Providing Depreciation, Fixation of Depreciation Amount, Methods of Recording and Providing Depreciation, AS-6(Revised) Depreciation Accounting

Final Accounts: Manufacturing Account, Trading Account, Profit and Loss Account, Balance Sheet, Simple Adjustment Entries

[No. of Hrs: 10]
UNIT – III
**Inventory Valuation:** Meaning of Inventory, Objectives of Inventory Valuation, Inventory Systems, Methods of Valuation of Inventories

**Accounting Standard 2 (Revised):** Valuation of Inventories

**Accounts of Non-profit Making Organizations:** Receipts and Payments Account, Income and Expenditure Account, Balance Sheet, Items Peculiar to Non-trading Concerns  

[No. Of Hrs: 10]

UNIT – IV

**Company Final Accounts:** Familiarity with the requirements of Schedule VI to the Companies Act 1956, Elementary Knowledge about Items in the Profit & Loss Account and Balance Sheet of a Company, (Preparation of Company Final Accounts not required)


[No. of Hrs: 10]

TEXT BOOKS:


REFERENCES:

OBJECTIVE: Effective management of Human Resources is one of the prerequisites of a successful organization, especially in the present day context of an evolving changing and competitive environment. Organizational effectiveness depends largely on its ability to manage the human behavior. A proper understanding of organizational dynamics and the various management concepts is essential for every manager. The objective of this paper is to provide understanding to the participants in understanding, predicting, and managing people at workplace through motivation, leadership, culture, performance management, career planning & development and stress management. Upon completion of this course, the students should be able to:

- Explain and apply principles of organizational behavior and management.
- Understanding management and organizational behavior with reference to key organizations in the IT sector- Apple, Intel, Cisco, Infosys, Google, IBM.
- Identify individual and organizational practices for managing workplace stress.
- Understand group dynamics, and specifically the way individuals within a group work together to attain certain goals.
- Understand organizational culture and managing change in organizations.

PRE-REQUISITE:
- Concept of Formal and Informal Organization Management

UNIT - I
Introduction to OB and Management Principles
Conceptual Framework; Challenges and Opportunities for OB; Managerial Implications; Evolution of Management Principles; Scientific Management Theories; Taylor and Scientific Management, Fayol’s Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach; Management Vs. Administration, Management Skills, Levels of Management, Characteristics of Quality Managers. Evolution of Management: Early contributions.

[No. of Hrs : 12]

Tutorial : [No. of Hrs: 04]
2 Article Review Presentations

UNIT - II
Planning: Types, Process & barriers, Management by Objectives; Organizational context of decisions, Types & process of decision making; Controlling; Organizing: Concept, Organisation Theories, Forms of Organisational Structure, Combining Jobs: Departmentation, Span of Control, Delegation of Authority, Authority & Responsibility, Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development

[No. of Hrs.; 10]

Tutorial : [No. of Hrs: 41]
Case 1: HBS case John Chambers – CISCO’s Driving Force.
Case 2: Larry Ellison - The Source of Oracle Wisdom, HBS case.
UNIT - III
Organizational structure & Design, Organizational Designs; Emerging Design Options Different Organizational Structures; Organizational Culture (creation and sustenance of cultures), Importance of Culture; Managing Culture; High performance culture, Learning organizations, ORganizational climate, Total Quality Management, Techniques of TQM, Re-engineering, Empowerment, Benchmarking, Downsizing, Controlling: Concept, Types of Control, Methods: Pre-control: Concurrent Control: Post-control, An Integrated Control System, Model for Managing Change, Forces for change, resistance to change, Management of resistance.

[No. of Hrs.; 10]
Tutorial: [No. of Hrs: 04/week]
Case 1: Case of Infosys (Learning Organisation) ICMR-LDEN003-ECCH-402-017-1
Case 2: Case of Google culture.

UNIT - IV
Individual Determinants of organizational, Behaviours; Motivation, Motivation and Performance, Theories Of Motivation, Approaches for Improving Motivation, Pay and Job Performance, Quality of Work Life, Morale Building, Performance Appraisal, Job Anxiety & Stress, Analysing, Interpersonal relations, Group Dynamics, Management of Organizational Conflicts, Management of Change, Leadership Styles & Influence Ethics and leadership.

[No. of Hrs.; 10]
Tutorial: No. of Hrs: 04/week]
Case 1: Apple Inc. HBS (February 29, 2008) Yoggie David B. Sturd Michael; N9-708-480
Case 2: Article Review: Leadership the Bill Gates Way – HBS case. [No. of Hrs: 01]

TEXT BOOKS:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. There should be 10 questions of short answer type of 2 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks including subparts, if any.

OBJECTIVE: The objective of this course is to introduce the fundamental techniques on which high-performance computing is based, to develop the foundations for analysing the benefits of design options in computer architecture, and to give some experience of the application of these techniques. It should be noted that the use of parallelism is secondary to the objective of achieving high performance.

PRE-REQUISITE:
- Computer Organization

UNIT – I
Parallel computer models: The state of computing, Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks
Program and network properties: Conditions of parallelism, Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Program flow mechanisms, Control flow versus data flow, Data flow architecture, Demand driven mechanisms, Comparisons of flow mechanisms. [No. of Hrs.: 10]

UNIT - II
System Interconnect Architectures: Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory, Multistage and combining network.
Memory Technology: Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology. [No. of Hrs.: 11]

UNIT - III
Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.
Pipelining: Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines. [No. of Hrs.: 11]

UNIT - IV
TEXT BOOKS:

REFERENCES:
3. Hwang and Briggs, “Computer Architecture and Parallel Processing”, MGH.
OBJECTIVE: This course covers the issues and techniques related to the Quality Management of software. The course will be helpful for the students and to get acquainted with the industry perspective towards software Quality. The content covers:

- Basic Concepts of Software Quality.
- Software Quality Assurance.
- Formal Technical Reviews.
- How it can be implemented.
- Describe how to conduct formal technical reviews and why they are the most important SQA activity.

PRE-REQUISITE:
- Concepts of Software Engineering

UNIT - I


UNIT - II
Tailoring the Software Quality Assurance Program: Reviews, Walkthrough, Inspection, and Configuration Audits.
Evaluation: Software Requirements, Preliminary design, Detailed design, Coding and Unit Test, Integration and Testing, System Testing, types of Evaluations.
Testing: Types of testing, Test Planning and conduct, Who does the testing? [No. of Hrs.: 12]

UNIT - III

UNIT - IV
Defect Analysis: Analyzing concepts, Locating data, Defect Repair and closure, Selecting metrics, Collecting measurements, Quality tools, Implementing defect analysis, Program Unit Complexity.
Corrective Action as to Cause: Identifying the Requirement for Corrective Action, Determining the Action to be Taken, Implementing the Correcting the corrective Action, Periodic Review of Actions Taken.
Traceability, Records, Software Quality Program Planning, Software Quality System Plan, Software Documentation. [No. of Hrs.: 10]

**TEXT BOOKS:**

**REFERENCE:**
OBJECTIVE
This course is an introduction to DSP concepts and implementation. It starts by explaining the need for
digital signal processing and DSP systems. A complete model of a DSP system is examined from the input
transducer, through all the stages including: signal conditioning, anti-aliasing filter, analog-to-digital
and digital-to-analog conversion, output smoothing filter, and output transducer. Correct acquisition of
the signal is absolutely necessary for proper use of digital signal processing.

PREREQUISITE
• Digital Electronics
• Operating System

UNIT – I
Discrete time signals and systems, Z-transforms, structures for digital filters, design procedures for FIR
and IIR filters. Frequency transformations: linear phase design; DFT. Methods for computing FFT. Noise
analysis of digital filters, power spectrum estimation.
Signals and signal Processing: characterization & classification of signals, typical Signal Processing
operations, example of typical Signals, typical Signals Processing applications.
Time Domain Representation of Signals & Systems: Discrete Time Signals, Operations on Sequences,
the sampling process, Discrete-Time systems, Time-Domain characterization of LTI Discrete-Time
systems.  
[No. of Hrs: 10]

UNIT – II
Transform-Domain Representation of Signals: the Discrete-Time Fourier Transform, Discrete Fourier
Transform, DFT properties, computation of the DFT of real sequences, Linear Convolution using the
DFT. Z-transforms, Inverse z-transform, properties of z-transform, transform domain representations of
random signals, FFT.
Transform-Domain Representation of LTI Systems: the frequency response, the transfer function,
types of transfer function, minimum-phase and maximum-Phase transfer functions.
[No. of Hrs: 12]

UNIT – III
Digital Processing of continuous-time signals: sampling of continuous signals, analog filter design,
anti-aliasing, filter design, sample-and-hold circuits, A/D & D/A converter, reconstruction filter design.
Digital Filter Structure: Block Diagram representation, Signal Flow Graph Representation, Equivalent
Structures, FIR Digital Filter Structures, IIR Filter Structures. transfer, modes of data transfer, priority
interrupt, direct memory access, input-output processor.  
[No. of Hrs: 10]

UNIT – IV
Digital Filter Design: Impulse invariance method of IIR filter design, Bilinear Transform method of IIR
Filter Design, Design of Digital IIR notch filters, FIR filter Design based on truncated fonner sens, FIR
filter design based on Frequency Sampling approach. Applications of DSP.
[No. of Hrs: 10]
TEXT BOOKS:

REFERENCES:
Practical will be based on following:

1. Linux Programming Lab  MCA 339
2. Software Testing Lab  MCA 341
3. Enterprising Lab  MCA 343
4. Lab based on Elective-I  MCA 345
Code No. : MCA 361
Paper: General Proficiency – V*

It is suggested to have a fundamental course Intellectual Property Rights (Software Systems Oriented) in this semester.

This paper is under Non University Examination system its detail content will be decided by the respective Institute, under approval of the coordination committee based on the requirement of individual institution.

*Non University Examination Scheme (NUES)

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.