ANNAMALAI UNIVERSITY
ANNAMALAINAGAR

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

(Syndicate Resolution No. 3, dated 15.12.2015)

MASTER OF COMPUTER APPLICATIONS (MCA)
(Three Year Degree Programme)
(Choice Based Credit System)
(FULL-TIME)

2015 – 2016 ONWARDS
MCA full-time programme will have a duration of six semesters. In the programme, the final semester is devoted to Project work only.

Each course is normally assigned one credit per lecture per week and one credit for two periods or part thereof for laboratory or practical.

The number of credits per semester for the full time programme shall be as follows:

First to fifth semesters : An average of 24 credits per semester
Sixth semester : 20 credits

The total credits for the programme will be 140. For the award of the degree, the student has to earn a minimum of 140 credits.

DURATION OF THE PROGRAMME

A student is normally expected to complete the full-time programme in six semesters but in any case not more than six years from the time of admission.

REGISTRATION FOR COURSES

A newly admitted student will automatically be registered for all the courses prescribed for the first semester, without any option.

Every other student shall submit a completed registration form indicating the list of courses intended to be credited during the next semester. This registration will be done a week before the last working day of the current semester. Late registration with the approval of the Dean on the recommendation of the Head of the Department along with a late fee will be done up to the last working day.

Registration for the project work shall be done only in the final semester.

ASSESSMENT

The subjects of study, scheme of assessment and syllabi are enclosed.

The break-up of assessment and examination marks for theory courses is as follows.

First assessment (Sessional Test - I) : 10 marks
Second assessment (Sessional Test - II) : 10 marks  
Assignment : 5 marks  
End Semester Examination : 75 marks  

The break-up of assessment and examination marks for practical courses is as follows.  
First assessment (Practical Test-I) : 15 marks  
Second assessment (Practical Test-II) : 15 marks  
Record note : 10 marks  
End Semester Examination : 60 marks  

The Project work will be assessed for 50 marks by a committee consisting of the Head of the Department, the guide and a minimum of two members nominated by the Head of the Department. The Head of the Department will be the chairman. 150 marks are allotted for the project work and viva-voce examination at the end of the semester.  

STUDENT COUNSELLOR  
To help the students in planning their course of study and for general advice on the academic programme, the Head of the Department will attach a certain number of students to a member of the faculty who shall function as student counsellor for those students throughout their period of study. Such student counsellors shall advise the students, give preliminary approval for the courses to be taken by the students during each semester and obtain the final approval of the Head of the Department.  

CLASS COMMITTEE  
For each semester, separate class committees will be constituted by the respective Head of Department.  

The composition of the class committees for each semester except the final semester shall be as follows:  
Teachers of the individual courses.  
A project co-ordinator (in the sixth semester committee only) who shall be appointed by the Head of the Department from among the project supervisors.  

The Head of the Department may opt to be a member or the chairman. All student counsellors of the class, and the Head of the Department (if not already a member) or any staff member nominated by the Head of the Department may opt to be special invitees.  

The class committee shall meet four times during the semester.  

The first meeting will be held within two weeks from the date of class commencement in which the type of assessment like test, assignment etc for the first and third assessments and the dates of completion of the assessments will be decided.  

The second meeting will be held within a week after the completion of the first assessment to review the performance and for follow-up action.  
The second assessment will be the mid-semester test.  

The third meeting will be held within a week after the second assessment is completed to
review the performance and for follow-up action.
The fourth meeting will be held after all the assessments except the examination are completed for all the courses, and at least one week before the commencement of the examinations. During this meeting the assessment on a maximum of 25 marks for theory and 40 marks for practical will be finalised for every student and tabulated and submitted to the Head of the Department for approval and transmission to the controller of examinations.

WITHDRAWAL FROM A COURSE

A student can withdraw from a course at any time before a date fixed by the Head of the Department prior to the second assessment, with the approval of the Dean of the Faculty on the recommendation of the Head of the Department.

TEMPORARY BREAK OF STUDY

A student can take a one-time temporary break of study covering the current semester and/or the next semester with the approval of the Dean on the recommendation of the Head of the Department, not later than seven days after the completion of the midsemester test. However, the student must complete the entire programme within the maximum period of six years for full time.

SUBSTITUTE ASSESSMENTS

A student who has missed, for genuine reasons accepted by the Head of the Department, one or more of the assessments of a course other than the end-of-semester examination, may take a substitute assessment for any one of the missed assessments. The substitute assessment must be completed before the date of the fourth meeting of the respective class committees.

A student who wishes to have a substitute assessment for a missed assessment must apply to the Head of the Department within a week from the date of the missed assessment.

ATTENDANCE REQUIREMENTS

To be eligible to appear for the end semester examination in a particular course, a student must put in a minimum of 80% of attendance in that course. However, if the attendance is 75% or above but less than 80% in any course, the authorities can permit the student to appear for the examination in that course on payment of the prescribed condonation fee.

A student who withdraws from or does not meet the minimum attendance requirement in a course must re-register for and repeat the course.

MARKS AND GRADING

A student cannot repeat the assessment of Sessional Test - I and Sessional Test - II. However, if for any compulsive reason the student could not attend the test, the
prerogative of arranging a special test lies with the teacher in consultation with the Head of the Department.

A minimum of 50% marks in each course is prescribed for a pass. A student has to secure 50% minimum in the End Semester Examinations.

If a candidate who has not secured a minimum of 50% of marks in a course shall be deemed to have failed in that course.

The student can repeat the End Semester Examination when it is offered next in the subsequent Odd/Even Semesters till the regulations are in force. However, a candidate cannot move to the next odd/even semester if he/she has more than six papers as arrears at any point of time.

A candidate who has secured a minimum of 50% marks in all courses prescribed in the programme and earned a minimum of the credits will be considered to have passed the Master's Programme.

**GRADING**

A ten point rating is used for the evaluation of the performance of the student to provide letter grade for each course and overall grade for the Master's Programme.

<table>
<thead>
<tr>
<th>Marks</th>
<th>Grade Points</th>
<th>Letter Grade</th>
<th>Class</th>
</tr>
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<tbody>
<tr>
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<td>10</td>
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<td>Exemplary</td>
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<tr>
<td>85-89</td>
<td>9.0</td>
<td>D + +</td>
<td>Distinction</td>
</tr>
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<td>80-84</td>
<td>8.5</td>
<td>D +</td>
<td>Distinction</td>
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<td>75-79</td>
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<td>Distinction</td>
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<td>7.5</td>
<td>A + +</td>
<td>First Class</td>
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<td>65-69</td>
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<td>60-64</td>
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<tr>
<td>55-59</td>
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<td>B</td>
<td>Second Class</td>
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<td>50-54</td>
<td>5.5</td>
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<td>Second Class</td>
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<td>49 or Less</td>
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<td>F</td>
<td>Fail</td>
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</table>

The Successful candidates are classified as follows.

I-Class 60% marks and above in over all percentage of marks (OPM).

II-Class 50-59% marks in over all percentage of marks.

Candidates who obtain 75% and above but below 90% of marks (OPM) shall be deemed to have passed the examination in First Class (Distinction) provided he/she passes all the courses prescribed for the programme at the first appearance.
Candidates who obtain 90% and above (OPM) shall be deemed to have passed the examination in First Class (Exemplary) provided he/she passes all the courses prescribed for the programme at the first appearance.

Candidates who obtain highest marks in all examinations at the first appearance alone considered for ranking.

COURSE-WISE LETTER GRADES

The percentage of marks obtained by a candidate in a course will be indicated in a letter grade.

A student is considered to have completed a course successfully and earned the credits if he/she secures an overall letter grade other than F. A letter grade F in any course implies a failure in that course. A Course successfully completed cannot be repeated for the purpose of improving the Grade point.

The F grade once awarded stays in the grade card of the student and is not deleted even when he/she completes the course successfully later. The grade acquired later by the student will be indicated in the grade sheet of the Odd/Even semester in which the candidate has appeared for clearance of the arrears.

If the student secures F grade in the Project / Field Work / Practical Work / Dissertation, he/she shall improve it and resubmit it, if it involves only rewriting incorporating the clarification of the evaluators or he/she can re-register and carryout the same in the subsequent semesters for evaluation.

ELECTIVES

Apart from the various courses offered in the curriculum of the branch of specialization, a student can choose two electives from any specialization under the faculty during the entire period of study, with the approval of the Head of the Department offering the course.
### ANNAMALAI UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

MASTER OF COMPUTER APPLICATIONS (M.C.A)

COURSES OF STUDY AND SCHEME OF EXAMINATIONS

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>Code No</th>
<th>Course Name</th>
<th>L</th>
<th>P</th>
<th>D</th>
<th>Sessional marks</th>
<th>Exam marks</th>
<th>Total marks</th>
<th>Credits</th>
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L – Lecture  
P-Practical  
D- Duration of Exam
## SECOND SEMESTER

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<th>Sessional marks</th>
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L – Lecture    P-Practical    D- Duration of Exam
### THIRD SEMESTER

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<td>MCAS3310</td>
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### FOURTH SEMESTER

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<td>MCAS4610</td>
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L – Lecture    P-Practical    D- Duration of Exam
### FIFTH SEMESTER

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<th>Code No</th>
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<td>MCAS5510</td>
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<td>MCAS5610</td>
<td>Programming Lab - IX (Software Design Lab)</td>
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<td>MCAS5710</td>
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**TOTAL**

|   |   |  |  |  | 20   | 12 | 21 | 205 | 495 | 700 | 24 |

### SIXTH SEMESTER

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<tbody>
<tr>
<td>MCAS6110</td>
<td>Project work and Viva-Voce</td>
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L – Lecture        P-Practical        D- Duration of Exam

**TOTAL NO. OF CREDITS: 140**
# ELECTIVE COURSES

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<td><strong>Elective - I</strong></td>
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<tr>
<td>MCASXX10A</td>
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<td>MCASXX10B</td>
<td>Service Oriented Architecture</td>
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<td>MCASXX10C</td>
<td>Client / Server Computing</td>
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<td>MCASXX10K</td>
<td>Cloud Computing</td>
</tr>
<tr>
<td>MCASXX10L</td>
<td>Natural Language Processing</td>
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</tbody>
</table>
MCAS1110: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

AIM: To understand the Mathematical Foundations of Computer Science like Basic principles of set theory, logic, Formal languages and Automata.

Unit–I


Unit-II

Basic Set Theory: Basic Definitions - Venn Diagrams and set operations - Laws of set theory - Principle of inclusion and exclusion - partitions- Permutation and Combination - Relations- Properties of relations - Matrices of relations - Closure operations on relations - Functions - injective, surjective and bijective functions.

Unit-III

Mathematical Logic: Propositions and logical operators - Truth table - Propositions generated by a set, Equivalence and implication - Basic laws- Some more connectives - Functionally complete set of connectives- Normal forms - Proofs in Propositional calculus - Predicate calculus.

Unit–IV

Formal Languages and Finite State Automata: Deterministic finite accepters – Regular languages- Non deterministic finite accepters-Equivalence of deterministic and Non deterministic finite accepters – Reduction of the number of states in finite automata – Regular expressions – Connection between regular expressions and regular languages.

Unit–V


Text Books:

Reference Books:
MCAS1210: DATA STRUCTURES

AIM: To Understand the concepts of Various Fundamental data structures and algorithms.

Unit-I 10 periods
Arrays: Representation of arrays. Stacks and Queues: Fundamentals – Evaluation of expression Infix to Postfix Conversion – Multiple Stacks and Queues – Analysis of the algorithms

Unit-II 12 periods

Unit-III 13 periods

Unit-IV 13 periods

Unit-V 12 periods

Text Books:

Reference Book:
MCAS1310: DATA BASE MANAGEMENT SYSTEMS

AIM: To study in detail about the Fundamentals of Database Management Systems, Various models of Database and its related application.

Unit -I 10 periods

Unit -II 12 periods

Unit -III 12 periods

Unit -IV 13 periods

Unit -V 13 periods

Text Books:

Reference Books:
MCAS1410: MICROPROCESSOR AND APPLICATIONS

AIM: To understand about Microprocessor and Microcontroller and design methods and Interfacing Techniques to digital systems.

Unit-I 10 periods

Unit-II 13 periods

Unit-III 12 periods

Unit-IV 12 periods
Peripherals and Interfacing: Serial and parallel I/O (8251 and 8255) – Programmable DMA Controller (8257)- Programmable interrupt controller (8259)- Keyboard display ADC/DAC interfacing- Inter integrated circuits interfacing (I2C standard).

Unit-V 13 periods
Microprocessor Based Systems Design-Digital Interfacing: Interfacing to alphabetic displays- Interfacing to liquid crystal display (LCD 16x2 line) – High power Devices and Optical motor shaft encoders- Stepper motor interfacing – nalog interfacing and Industrial control – Microcomputer based small scale – Industrial process control system – Robotics and Embedded control – DSP and Digital Filters.

Text Books:

Reference Books:
Ltd. 1995.
MCAS1510: PROBLEM SOLVING TECHNIQUES AND C

**AIM:** To Study about the methods of analyzing Algorithms and to learn the C Language features.

**Unit-I** 12 periods

**Unit-II** 13 periods
**Fundamental Algorithms:** Introduction – Exchanging the values – Counting – Factorial Computation – SINE computation – Base Conversion – Factoring Methods – Array Techniques.

**Unit-III** 12 periods
**Introduction to C Language:** Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input/output Operations – Formatted I/O – Decision Making - Branching — IF, Nested IF – Switch – goto - Looping- While, do, for statements.

**Unit-IV** 13 periods
**Arrays, Functions, Structures And Unions:** Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion - Structures and Unions – Array of Structures – Structures and Functions.

**Unit-V** 10 periods

**Text Books:**

**Reference Books:**
MCAS2110: ACCOUNTING AND FINANCIAL MANAGEMENT

AIM: To study the basic Accounting and Financial Management Practices.

Unit-I 12 periods

Unit-II 13 periods

Unit-III 13 periods

Unit-IV 12 periods

Unit-V 10 periods

Text Books:

Reference Books:
MCAS2210: COMPUTER ARCHITECTURE

AIM: To study about design of instruction set, pipelining, memory system and multiprocessors and multicomputer.

Unit-I 12 periods

Unit-II 12 periods

Unit-III 12 periods
Pipelining - Comparison of Pipelined and non Pipelined Computers – Instruction and Arithmetic Pipelines – Structural Hazards and Data Dependencies – Branch Delay and multicyle instructions – Superscalar Computers.

Unit-IV 13 periods

Unit-V 11 periods
Multiprocessors and Multicomputers - SISD - SIMD and MIMD architectures - Centralized and Distributed Shared Memory- Architectures-Cache Coherence.

Text Book:

Reference Books:
MCAS2310: SOFT SKILLS DEVELOPMENT

Unit-I                          12 periods

Soft skills and developing positive Attitude
Soft skills: introduction – what are soft skills? - selling your soft skills - attribute regarded as soft skills – soft skills – social- soft skills- thinking – soft skills -Negotiating –exhibiting your soft skills- indentifying your soft skills- improving your soft skills - soft skills training –train yourself-top 60 soft skills.
Developing positive attitude: introduction – meaning - features of attitudes- attitude and behavior formation of attitudes– change of attitudes – what can you do to change attitude?-ways of changing attitude in a person – attitude in a workplace – the power of positive attitude-developing positive attitude-example of positive attitude- example of negative attitude-over coming negative attitude- negative attitude and its result.

Unit-II                         12 periods

Art of speaking and writing
Art of speaking: Introduction-what make communication important? - Defining communication-special features of communication – communication process- channel of communication-importance of communication - tips for effective communication - tips for powerful presentation-art of public speaking - importance of public speaking.

Unit-III                        12 periods

Body language
Introduction – body talk – voluntary and involuntary body language-forms of body language-parts of body language - origin of body language - uses of body language - body language in building interpersonal relations – body language in building industrial relations-reason to study body language-improving your body language – types of body language-Gender differences-female interest and body language - shaking hands with women - interpreting body language-developing confidence with correct body language.

Unit-IV                        12 periods

Group discussion
Introduction – meaning of GD – why group discussion? - characters tested in a GD – tips on GD – types of GD - skills required in a GD - consequences of GD - behavior of a GD - essential elements of GD - different characters in GD - traits tested in a GD - GD etiquette - areas to be concentrated while preparing for a GD - imitating a GD - techniques to initiate a GD - Non-verbal communication in GD – movement and gestures to be avoided in a GD-topics for GD.

Interview skills
Introduction – why an interview?.- types of interview - interview panel-types of questions asked-reason for selecting a candidate –reason for rejecting a candidate – on the day of interview– on the interview table – attending job fair-common mistakes that you would’t want to do-questions the candidate should not ask during the interview –post- interview etiquette-how does one follow up?- telephonic interview –dress code at interview – typical questions
asked – interview mistakes – quick tips - how to present well in interview – tips to make a good impression in an interview – job interview - basic tips - how to search for job effectively – interview quotations.

Unit-V                         12 periods
Time management
Introduction- the 80:20 rule- take a good look at the people around you- examine your work-sense of time management – time is money – features of time- three secretes of time management - time management matrix- analysis of time matrix-effective scheduling – grouping of activities – five steps to successful time management –difficulties in time management- evils of not planning - time management is a myth – overcoming procrastination – ways of find free time- time management tips for students – interesting facts about time- ideal way of spending a day- time wasters – time savers – realizing the value of time-time circle planner.

Text Book:


Reference Book:

MCAS2410: OPERATING SYSTEMS

**Aim:** The basic objective of this lesson is to provide students with the understanding and knowledge of Operating System Concepts.

**Unit-I**

12 periods


**Unit-II**

12 periods


**Unit-III**

12 periods

**Memory Management** – Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Virtual Memory Background - Demand Paging – Copy-on-Write – Page Replacement – Allocation of Frames – Thrashing – Memory- Mapped Files – Allocating Kernel Memory – Other Considerations – Operating System Examples.

**Unit-IV**

12 periods


**Unit-V**

12 periods

**Text Book:**


**Reference Books:**

3. https://android.googlesource.com
MCAS2510: INTERNET AND JAVA PROGRAMMING

AIM: To Study about Internet, Core java. Java swing, JDBC, Java Beans and Servlets

Unit-I
Internet: Internet- Connecting to Internet: Telephone- Cable- Satellite connection- Choosing an ISP- Introduction to Internet Services- E-mail Concepts- Sending and Receiving secure E-mail- Voice and Video Conferencing.

Unit-II

Unit-III
JDBC: The connectivity Model- JDBC/ODBC Bridge- Java.sql package- connectivity to remote database- navigating through multiple rows retrieved from a database.

Unit-IV
Java Beans: Application Builder tools- The bean developer kit(BDK)- JAR files- Introduction- Developing a simple bean- using bound properties- The java Beans API- Session Beans- Entity Beans- Introduction to Enterprise Java Beans(EJB) -Introduction to RMI(Remote Method Invocation): A simple client-server application using RMI.

Unit-V
Java Servlets: Servlet basic- Servlet API basic- Life cycle of a Servlet- Running Servlet- Debugging Servlet- Thread-safe Servlet- HTTP Redirects- Cookies- Introduction to Java server pages (JSP).

Text Books:

Reference Books:
MCAS3110: RESOURCE MANAGEMENT TECHNIQUES

**AIM:** To understand the underlying concepts of linear programming, Classical optimization theory and project scheduling.

**Unit-I**

10 periods
Linear programming (LP) LP formulation and graphical solution - the simplex method - revised simplex method.

**Unit-II**

12 periods
Duality and networks - definition of the dual problem - primal - Dual relationships - Dual simplex method - transportation and assignment models - transhipment models - network minimization - shortest route problems.

**Unit-III**

12 periods
Integer programming - cutting plane algorithms, Branch and bound Algorithm - Multistage (dynamic) programming solution of LP by dynamic programming.

**Unit-IV**

13 periods

**Unit-V**

13 periods
Project scheduling. network diagram representation - critical path Computation - time charts and resources levelling – PERT Networks

**Text Book:**

**Reference Books:**
MCAS3210: COMPUTER NETWORKS

AIM: To study the various protocol models, Network services based on the Computer Networks

Unit-I  10 periods
The physical layer: The theoretical basis for data communication – Guided Transmission media - Wireless transmission – PSTN - Mobile telephone - Communication satellite.

Unit-II  12 periods
The Data Link Layer: Data link layer design issues - Error detection and correction - Elementary data link protocols - Sliding window protocols - Example of data link protocols- ETHERNET – 802.11- 802.16- Bluetooth- Data link layer Switching.

Unit-III  13 periods
The network layer: Network layer design issues - Routing algorithms - Congestion control algorithms - Internetworking- Network layer in Internet. Network Services BOOTP and DHCP-Domain Name Service-WINS-Web Serving and Surfing Web servers -Web clients (browsers).

Unit-IV  13 periods
The transport layer: Transport layer design issues - Transport protocols - Simple transport protocol - Internet transport protocols UDP- TCP.

Unit-V  12 periods

Text Book:

Reference Book:
MCAS3310: SOFTWARE ENGINEERING

AIM: To create software based on a set of procedures so that it can comply with some predefined standards.

Unit-I

12 periods


Unit-II

12 periods


Unit-III

12 periods

Software Design: Design Concepts – Design Models – Pattern Based Design – Architectural Design –Component Level Design – Component – Class Based And Conventional Components Design – User Interface – Analysis And Design

Unit-IV

12 periods


Unit-V

12 periods


Text Book:


Reference Books:

MCAS3410: COMPILER DESIGN

AIM : To study the basic principles involved in compiler Design.

Unit-I  
Introduction To Compilers: 10 periods  
Translators - Compilation and Interpretation- The phases of Compiler-Errors encountered in different phases-The grouping of phases- Compiler construction tools-A simple one-pass compiler – Language design-Programming language grammars-Derivation-Reduction and Ambiguity.

Unit-II  
Lexical Analysis: 13 periods  
Need and role of lexical analyzer-Input Buffering-Lexical errors-Expressing tokens by Regular Expression - Finite Automata-Converting regular expression to NFA - Converting NFA to DFA-Minimization of DFA - Language for specifying lexical analyzers-LEX - Design of lexical analyzer for a sample language.

Unit-III  
Syntax Analysis: 13 periods  

Unit-IV  
Syntax Directed Translation: 12 periods  
Syntax-directed definitions-Construction of syntax trees-Bottom-up evaluation, L-attributed definitions-Top down translation, Recursive Evaluator Method, Comparison of Translation Methods. Syntax directed translation for declaration statements, assignment statements, Boolean expression, control flow statements, procedure calls.

Unit-V  
Run-Time Environment: 12 periods  
Source language issues-Storage organization-Storage allocation-access to non local names - parameter passing-Symbol tables.

Code Optimization and Code Generation:  

Text Book:

Reference Books:
MCAS3510: UNIX AND WINDOWS PROGRAMMING

AIM: To study the basic principles of Unix operating system shell programming and windows programming.

Unit-I 10 periods

Unit-II 12 periods
Programming with the shell – Advanced features of the shell – Simple filters – advanced filters– Line editing with Examples–System administration.

Unit-III 13 periods
Building a program – Types and names – Creating a main window – Event driven programming – Window messages – Displaying text Resources and projects – Menus.

Unit-IV 12 periods

Unit-V 13 periods

Text Books:

Reference Books:
MCAS4110: DATA WAREHOUSING AND MINING

AIM: To studies the basic principles of data mining and data warehousing architecture.

Unit-I 11 periods

Unit-II 13 periods

Unit-III 13 periods

Unit-IV 12 periods

Unit-V 11 periods

Text Books:

Reference Books:
2. Jiawei Han, Micheline Kamber, “Data Mining: Concepts and Techniques” Morgan Kaufmann Publishers, 2000.
MCAS4210: WEB TECHNOLOGY

AIM: Students should possess a firm grounding in some of the existing web technologies as well as commercial web applications.

Unit-I 10 periods

Unit-II 12 periods
Frames, Forms and CSS: Frames, Forms and controls, Embedding audio, video and animated files in HTML, CSS –Understanding CSS, Internal CSS, External CSS, Font Properties, Text Properties, Color and Background properties, Table properties, Numbering and List Properties.

Unit-III 13 periods
JavaScript: Data types and literals, operators, conditional statements, loop constructs, reserved words; core Objects: Array Object, Date Object; Functions: passing value to JavaScript functions, user defined functions, Handling old browsers, java script events, formatting cookie, retrieving cookie value from the cookie file, removing a cookie, animations using events.

Unit-IV 13 periods

Unit-V 12 periods
PHP & MySQL: Why PHP and MySQL - Server-Side Web Scripting - Getting Started with PHP - Adding PHP to HTML -Syntax and Variables - Control and Functions - Passing Information between Pages – Strings – Arrays and Array Functions – Numbers - MySQL Database Administration - PHP/MySQL Functions -Displaying Queries in Tables - Building Forms from Queries.

Text Books
MCAS4310: MOBILE COMPUTING

AIM: To study the need and nature of mobile applications and understand the design issues in the development of mobile applications.

UNIT-I  12 periods

UNIT-II  12 periods

UNIT-III  12 periods
**Application Design:** Memory Management – Design Patterns for Limited Memory - Work Flow for Application development – Techniques for Composing Applications - Dynamic Linking - Plug ins and rule of thumb for using DLLs - Concurrency and Resource Management - Look and Feel

UNIT-IV  12 periods
**Application Development:** Intents and Services – Storing and Retrieving data – Communication via the Web – Notification and Alarms – Graphics and Multimedia – Telephony – Location based Services – Packaging and Deployment – Security and Hacking

UNIT-V  12 periods

**Text Books:**

**Reference Books:**
MCAS4410: C# and .NET FRAMEWORK

**AIM:** To study about the .NET Framework, C# Basics, Libraries and advanced features of C#.

**Unit-I**  
10 periods  

**Unit-II**  
12 periods  
C# Basics: Introduction- Data types- Identifiers- Variable & constants- C# statements- Object Oriented Concepts- Object and classes- Arrays and Strings- System collections- Delegates and Events- Indexes Attributes- Versioning.

**Unit-III**  
12 periods  

**Unit-IV**  
13 periods  
Advanced Features Using C#: Web Services-Windows services- messaging- Reflection- COM and C#- Localization.

**Unit-V**  
13 periods  
Distributed application in C#- XML and C#- Unsafe Mode- Graphical Device Interface with C#- Case Study (Messenger Application).

**Text Books:**

**Reference Books:**
MCAS5110: SOFTWARE TESTING AND QUALITY ASSURANCE

AIM: To study behavior of the testing techniques to detect the errors in the software, functionality of automated testing tools and understands the models of software reliability

UNIT- I  

UNIT-II  

UNIT- III  

UNIT-IV  

UNIT-V  

**Text Books:**

**Reference Books:**
MCAS5210: COMPUTER GRAPHICS AND MULTIMEDIA

AIM: To understand the computer graphics concept in detail and multimedia system application.

Unit-I 10 periods

Unit-II 12 periods
2D Transformations: Two dimensional transformations – Interactive Input methods - Polygons - Splines – Bezier Curves - Window view port mapping transformation.

Unit-III 13 periods

Unit-IV 12 periods

Unit-V 13 periods

Text Books:

Reference Books:
MCAS5310: OBJECT ORIENTED ANALYSIS AND DESIGN

AIM: To Study the OOPs Concepts that are used in the OOSD.

Unit-I 10 periods

Unit-II 12 periods
Classes and Objects: The Nature of an Object-Relationships among Objects-The Nature of a Class-Relationships among Classes-The Interplay of classes and objects-On building quality classes and objects.

Unit-III 13 periods
Classification: The Importance of Proper Classification-Identifying Classes and Objects- Key Abstractions and Mechanisms.

Unit-IV 12 periods

Unit-V 13 periods
Analysis- Design- Evolution and Maintenance of:
1)Data Acquisition:Weather Monitoring Station.
2)Frameworks:Foundation Class library and
3)Client/Server Computing:Inventory Tracking.

Text Book:

Reference Books:
MCAS5410: BIG DATA ANALYTICS

**AIM:** To understand the concepts of Big Data Analytics

**Unit-I**


**Unit-II**


**Unit-III**


**Unit-IV**

**Frequent Itemsets and Clustering:** Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets in a Stream – Clustering Techniques – Hierarchical – K-Means – Clustering High Dimensional Data – CLIQUE And PROCLUS – Frequent Pattern based Clustering Methods – Clustering in Non-Euclidean Space – Clustering for Streams and Parallelism.

**Unit-V**

**Hadoop and R for Visualization:** Background and fundamentals-moving data in and out of Hadoop-data serialization-applying MapReduce patterns to big data- streaming big data-integrating R and Hadoop for statistics and more-predictive analytics with Mahout- Hacking with Hive-Programming pipelines with pig – HBase-MySQL-NoSQL- RHadoop

**Text Books:**


**Reference Books:**

MCASXX10A: OPEN SOURCE RESOURCES

AIM: To Study about the open source resources tools and technologies. Example: Python

Unit-I 12 periods
Introduction: Introduction to open sources- Need of Open Sources- Advantages of Open Sources- Applications of Open Sources- commercial aspects of Open source movement.

Unit-II 12 periods

Unit-III 12 periods

Unit-IV 12 periods

Unit-V 12 periods
Case Study: Government Policy toward Open Source (E-Governance) – Wikipedia as an Open source project.

Text Books:

Reference Books:
AIM: To Study the Service Oriented Architecture for Web services, Business Process management etc.

Unit-I 10 periods

Unit-II 12 periods

Unit-III 13 periods

Unit-IV 13 periods

Unit-V 12 periods

Text Books:

Reference Books:
MCASXX10C: CLIENT / SERVER COMPUTING

AIM: To study about Client/Server Computing and its Characteristics Role of the Client- and server Components Type of server Network Characteristics, and application development tools

Unit-I 10 periods

Unit-II 12 periods

Unit-III 13 periods

Unit-IV 12 periods

Unit-V 13 periods

Text Book:

Reference Books:
MCASXX10D: NETWORK SECURITY

AIM: To study the various issues concerning Network security, Database security and Program security

Unit-I

10 periods

Unit-II

13 periods

Unit-III

12 periods

Unit-IV

13 periods

Unit-V

12 periods

Text Books:
MCASXX10E: ARTIFICIAL INTELLIGENCE

AIM: To understand the concept of artificial Intelligence, Reasoning, Fuzzy sets and applications

Unit-I 10 periods

Unit-II 13 periods

Unit-III 13 periods

Unit-IV 12 periods
Fuzzy Sets: Definitions - Basic set-theoretic operations for fuzzy sets - Fuzzy measures and measures of fuzziness - fuzzy relations on sets and fuzzy sets - fuzzy functions on fuzzy sets - Fuzzy logic.

Unit-V 12 periods
Applications: Principles of Natural Language Processing - Expert systems - Knowledge acquisition concepts - Introduction to Agents.

Text Books:

Reference Book:
AIM: To learn basic concepts of neuron, model of neuron and Fuzzy logic and its operation.

**Unit-I** 12 periods

**Unit-II** 12 periods

**Unit-III** 12 periods
Radial basis function neural networks - Basic learning laws in Radial basis function nets - Counter propagation networks - Adaptive resonance theory networks - Applications of neural nets such as pattern recognition – Optimization - Associative memories - speech and decision-making.

**Unit-IV** 12 periods

**Unit-V** 12 periods

**Text Books:**

**Reference Books:**
**MCASXX10G: Open CL PROGRAMMING**

**AIM:** To learn basic concepts of various processors and open CL program

<table>
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<tr>
<th>Unit-I</th>
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<tr>
<td>Overview of pipelining and Instruction Level parallelism. Introduction to Multiprocessors, Shared memory architecture, Multi-threading, Interconnection networks and clusters. Architecture of recent CPUs and GPUs: Intel Dual and Quad core processors, NVDIA Fermi and AMD Fusion processors.</td>
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<th>Unit-II</th>
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<td>Programming with MPI: Introduction, collective communication, programming model and GPU programming.</td>
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<th>Unit-III</th>
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<tr>
<td>Open CL programming on CPU/GPU/APU: Software and hardware overview. Open CL for GPU/APU processor, memory access and architecture, communication between Host and GPU, device scheduling, terminology, programming model and example programs.</td>
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<th>Unit-IV</th>
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<tr>
<td>Building and running Open CL programs on GPU/APU: compiling, running calling conventions, predefined macros, debugging, setting the environment and breakpoint and sample GDP session.</td>
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<tr>
<td>Open CL Applications on GPU/APU: Few examples of applications in Electromagnetic Estimations, Digital Signal Processing, Video processing and Image processing.</td>
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**Text Book:**

**Reference Books:**
MCASXX10H: DIGITAL IMAGING PROCESSING

AIM: To introduce the basic concept of image processing. To explore the time and frequency Aspects of image processing.

Unit-I 10 periods

Unit-II 12 periods

Unit-III 12 periods

Unit-IV 13 periods

Unit-V 13 periods
Morphological Image Processing: Introduction-Dilation- Erosion- Opening- Closing- Hit-or-Miss transformation- Morphological algorithm operations on binary images- Morphological algorithm operations on gray-scale images.
Image Segmentation: Detection of discontinuities- Edge linking and Boundary detection- Thresholding- Region based segmentation.
Image Representation and Description: Representation schemes- Boundary descriptors- Regional descriptors.

Text Books:

Reference Book:
**MCASXX10I: E-COMMERCE**

**AIM:** To study the basic concepts of E-Commerce network Infrastructure- Information publishing Technology security and search Engine Service

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<tr>
<td><strong>Unit-I</strong></td>
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<tr>
<td>Introduction to E–Commerce: Benefits – Impacts - Classification and Application of E-Commerce - Business Model - Architectural Frame Work</td>
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<td>13</td>
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**Text Book:**

**Reference Books:**
AIM: To Study about Pattern Classification models and techniques like Bayesian belief networks and Support vector machines etc.

Unit-I 12 periods

Unit-II 12 periods

Unit-III 12 periods

Unit-IV 12 periods

Unit-V 12 periods

Text Books:

Reference Books:
AIM: To help the learners understand the underlying principles of various techniques available for Cloud Computing, Virtualization techniques, Cost effectiveness, Vulnerability, Data Security and Advantages of Green Computing.

Unit-I
Introduction: Basics, applications, intranet and cloud, examples: Amazon, Google, Microsoft, IBM—advantages and disadvantages of cloud computing, Google appengine, Microsoft Azure, Amazon(EC2, S3,SQS),open stack, cloud computing services

Unit-II

Unit-III
Software as Service: overview-driving forces-company offerings-industries. Software plus services: Overview-mobile device integration-providers-Microsoft Online.

Unit-IV
Developing Applications: Google-Microsoft-Intuit QuickBase-Cast Iron Cloud-Bungee Connect-Development (Appengine, Azure, openstack etc.)- trouble shooting and application management.

Unit-V
Local clouds and thin clients: Virtualization-server solutions-thin clients. Cloud Migration: cloud services for individuals-enterprise cloud- methods for migration-analyzing cloud services.

Text Book:

Reference Books:
MCASXX10L: NATURAL LANGUAGE PROCESSING

AIM: To inculcate the concepts of natural language Processing: Language related algorithms and techniques, Computational morphology and Phonology, passing and semantic interpretation

Unit-I 12 periods

Unit-II 12 periods

Unit-III 12 periods

Unit-IV 12 periods

Unit-V 12 periods

Text Book:

Reference Books: