

ALAGAPPA UNIVERSITY

**Accredited with A+ Grade by NAAC (CGPA 3.64) in the Third Cycle
Karaikudi – 630003. Tamilnadu , INDIA**

Directorate of Distance Education



PROGRAMME PROJECT REPORT

for

Master of Science in Information Technology M.Sc(I.T)

Submitted to

**UGC, Distance Education Bureau (DEB),
New Delhi**

**for seeking approval to introduce programme through
Distance Education Mode**

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**ALAGAPPA UNIVERSITY, KARAIKUDI
DIRECTORATE OF DISTANCE EDUCATION**

PROGRAMMME PROJECT REPORT

Master of Science in Information Technology (M.Sc (IT))

(a) Programme's Mission and Objectives

Mission

Mission is to impart employability and creativity to the Post graduate students and lives up to the standards of Information Technology (IT) industry.

Programme Objectives:

- ✓ To facilitate students to nurture skills to practice their professions competently to meet the ever-changing needs of society such as Digital India, Safety and Privacy.
- ✓ Discover, investigate the requirements of a problem and find the solution to them using computing principles.
- ✓ Create and evaluate a computer based system, components and process to meet the specific needs of cutting edge technologies.
- ✓ Utilize current techniques and tools necessary for complex computing practices.
- ✓ Develop and integrate effectively system based components into user environment.
- ✓ Identify the need and develop the skill to employ in learning as a computing professional.
- ✓ Execute effectively in a team environment to achieve a common goal.
- ✓ Classify opportunities and use innovative ideas to create value and wealth for the betterment of the individual and society.
- ✓ Proficiency in developing application with required domain knowledge.

Programme Outcome:

- ✓ To develop in problem solving and programming skills in the various computing fields of IT industries
- ✓ To widen the ability to plan, analyze, design, code, test, implement & maintain a software product for real time system
- ✓ To support students capability to set up their own enterprise in various sectors of Computer applications
- ✓ To knowledge the students in finding solutions and developing system based applications for real time problems in various domains involving technical, managerial, economical & social constraints
- ✓ To prepare the students to pursue higher studies in computing or related disciplines and to work in the fields of teaching and research.

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(b) Relevance of the program with HEI's and Alagappa University Mission and Goals

This programme is aligned with HEI's and Alagappa University mission and goals to be offered through distance mode to reach quality higher education to the unreachable and/or rural learners. Higher education in Computer Science offered through distance mode meets the mission of HEI's like digital India and e-cash transaction will enrich the Human resources for the uplift of the nation.

(c) Nature of prospective target group of learners

The nature of prospective target group of learners is graduates from various disciplines like Commerce, Mathematics, Physics, Chemistry, Biology, Electronics, and Engineering etc. It also includes the learners who want to become entrepreneurs like Web Designers, Software Developers, BPO's, KPO's etc.,

d) Appropriateness of programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence;

M.Sc (IT) Programme through Distance Learning mode is developed in order to give subject-specific skills including i) Knowledge about various kinds of programming languages ii) Principles of Information Technology, Operating systems, RDBMS, Data Structure and Software Engineering ,Computer Networks, Concepts like Object Oriented Analysis and Design ii) Cutting Edge Technologies like Web Technology, .Net Frameworks, Mobile Communications.

(e) Instructional Design

e.1 Revisions of Regulation and Curriculum Design

1. The University reserves the right to amend or change the regulations, schemes of examinations and syllabi from time to time based on recent market dynamics, industrial developments, research and feedback from stakeholders and learners.
2. Each student should secure 64 credits to complete M.Sc (IT). programme.
3. Each theory and practical course carries 4 credits with 75 marks in the University End Semester Examination (ESE) and 25 marks in the Continuous Internal Assessment (CIA).

Programme code

M.Sc (Information Technology	313
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M.Sc(IT) Credit Based Curriculum and Evaluation System

M.Sc(IT) COURSE OF STUDY & SCHEME OF EXAMINATIONS

S.No	Subject Code	Title of the course	CIA Marks Max.	ESE Marks Max.	Total Marks Max.	C Max.
FIRST YEAR						
I SEMESTER						
1	31311	Computer Organization and Architecture	25	75	100	4
2	31312	Object Oriented Programming and Java	25	75	100	4
3	31313	Data Structures and Algorithms	25	75	100	4
4	31314	Object Oriented Programming and Java Lab	25	75	100	4
		Total	100	300	400	16
II SEMESTER						
5	31321	Data Mining and Warehousing	25	75	100	4
6	31322	Relational Database Management Systems (RDBMS)	25	75	100	4
7	31323	Visual Programming with •NET	25	75	100	4
8	31324	VB•NET & RDBMS Lab	25	75	100	4
		Total	100	300	400	16
SECOND YEAR						
III SEMESTER						
9	31331	Open Source Software	25	75	100	4
10	31332	Operating Systems	25	75	100	4
11	31333	Computer Networks	25	75	100	4
12	31334	Open Source Lab	25	75	100	4
		Total	100	300	400	16
SEMESTER IV						
13	31341	Web Technology	25	75	100	4
14	31342	Software Engineering	25	75	100	4
15	31343	Cloud Computing	25	75	100	4
16	31344	Web Technology Lab	25	75	100	4
		Total	100	300	400	16
		Grand Total	400	1200	1600	64

CIA : Continuous Internal Assessment **ESE** : End semester Examination **Max.** Maximum Marks; **C**: Credits

Course Code Legend:

3	1	3	S	C
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313 – Programme code for Master of Information Technology (M.Sc(IT) S

-- Semester Number

C – Course Number in the Semester

M.Sc(IT) Credit Based Curriculum and Evaluation System

e.2 Detailed Syllabi

The detailed Syllabi of study and shall be as shown in Appendix.

e.3 Duration of the Programme:

The M.Sc (IT) programme shall consist of a period of two years (Four Semesters).

e.3.1 Medium of Instruction

The medium of instruction is only in **English**.

The course material is also in **English**.

e.4 Faculty and Support Staff Requirements:

The following faculty and support staff is required for this programme.

S.No	Staff Category	Numbers
1	Core Faculty*	3
2	Specialization Faculty	2
3	Lab Assistant	1
4	Clerical Assistant	1

* Faculty at least in Assistant Professor level

e.5 Instructional Delivery mechanisms

The instructional delivery mechanisms of the programme includes SLM- Study materials, Lab instruction manual, Personal contact session for both theory and practical courses of the programme, e-version of the course materials in the form of CD, e-book, e- tutorials, Massive Open Online Courses (MOOC) courses, Open Educational Resources(OER) and virtual lab.

e.6 Identification of media

The printed version of SLM – study material shall be given to the learners in addition to MOOC, e-tutorial and virtual lab.

e.7 Student Support Services

The student support services will be facilitated by the Directorate of Distance Education, Alagappa University, Karaikudi and its approved learning centres located in various parts of Tamilnadu.

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The pre-admission student support services like counseling about the programme including curriculum design, mode of delivery, fee structure and evaluation methods will be explained by the staff at Directorate of Distance Education or Learning centres.

The post-admission student support services like issuing Identity card, study materials will be provided thru Directorate or Learning centres. The face to face contact sessions of the programme for both theory and practical's will be held at the Directorate or Learning centres.

The student support regarding the conduct of examinations, evaluations, publication of results and certificates are done by Office of the Controller of Examinations, Alagappa University, Karaikudi.

f. Procedure for Admission:

f.1 Minimum qualification for admission

Candidates for admission to the Master of Science in Information Technology (M.Sc(I.T)) programme shall be required to have passed any degree of any Recognized University or authority accepted by the Syndicate of the Alagappa University as equivalent thereto shall be eligible.

f.2 Curriculum transaction

- The face to face contact sessions in class room teaching with the support of SLM, Power Point Presentations, web based tools, audio and animated videos.
- The practical classes are based on the respective subject study materials containing requirement for the laboratory experiments.
- Face to face contact sessions will be conducted for both theory and practical courses in the following manner.

Course Type	Face to face contact session per semester (in Hours)
Theory courses (3 Courses with 4 credits each)	48
Practical courses (1 Course with 4 credit)	120
Total	168

f.3 Evaluation

The examinations shall be conducted separately for theory and practical's to assess the knowledge acquired during the study. There shall be two systems of examinations viz., internal and external examinations. In the case of theory courses, the internal evaluation shall be conducted as Continuous Internal Assessment via. Student assignments preparation and seminar, etc. The internal assessment shall comprise of maximum 25 marks for each course. The end semester examination

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shall be of three hours duration to each course at the end of each semester. In the case of Practical courses, the internal will be done through continuous assessment of skill in demonstrating the experiments and record or report preparation. The external evaluation consists of an end semester practical examinations which comprise of 75 marks for each course.

Internal assessment

- Internal assessment of theory courses is through home assignment with workbook, case studies, review questions, quiz, multiple choice questions etc., for 25 marks.
- The internal assessment for the practical courses shall be through home assignment which includes workbook designing algorithm, preparing source code, PL/SQL coding etc., for 25 marks.
- Student should submit assignment for theory and practical courses of every course and semester.

Division of Internal Marks (Assignment)

Theory		Practical	
Assignment	Marks	Assignment	Marks
Review questions	15	Algorithm Design	15
Workbook, case studies, quiz, multiple choice questions	10	Workbook for preparing source code, PL/SQL coding , results	10
TOTAL	25	TOTAL	25

End Semester Examination (ESE)

The university end Semester Examinations shall be of three hours duration with maximum of 75 Marks for both theory and practical courses.

f.3.1 Minimum for a pass:

- For internal Examination, the passing minimum shall be 40% (Forty Percentage) of the maximum marks (25) prescribed for UG and PG Courses.
- For External Examination, the passing minimum shall be 40% (Forty Percentage) of the maximum marks (75) prescribed for UG and PG Courses.
- In the aggregate (External + Internal), the passing minimum shall be 40% for UG and 50% for PG courses.

f.3.2 Question Paper Pattern - Theory

The end semester examination will be conducted in the duration of 3 Hours and maximum of 75 Marks.

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All the Blocks Should Be Given Equal Importance

Part – A (10 x 2 Marks: 20 Marks) Answer all questions

Part – B (5 x 5 Marks: 25 Marks) Answer all questions choosing either (a) or (b)

Part – C (3 x 10 Marks: 30 Marks) (Answer any 3 out of 5 questions)

End Semester Examination (ESE) - Practical

Students are required to prepare a separate lab record for each lab course. The practical counsellor should duly sign this lab record after each session.

Students shall prepare practical record note book which includes aim, algorithm, source code, input, expected output and result of the experiment and submit during end semester practical examination.

Division of marks in ESE – Practical (Maximum 75 marks)

The end semester practical examination will be conducted in the duration of 3 Hours and maximum of 75 Marks.

Practical details	Max. Marks
Algorithm / Flowchart	10
Source Code	20
Debugging	10
Execution	10
Results	10
Viva-Voce	5
Record	10
Total	75

f.3.3 Procedure for Completing the Course:

A student shall be permitted to continue the programme from I to IV semester irrespective of failure(s) in the courses of the earlier semesters. The candidate will qualify for the M.Sc(IT) degree only if he/she passes all the (including arrears) courses with in a period of FIVE years from the date of admission.

f.3.4 Results and Classification:

Results will be declared at the end of each semester of the University examination and the marks/grade obtained by the candidate will be forwarded to them by the Controller of Examinations, Alagappa University.

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f.3.4.1 Marks and grades

The following table gives the marks, grade points, letter, grades and classification to indicate the performance of the candidate.

Range of Marks	Grade Points	Letter Grade	Description
96-100	10.00	S+	First class – Exemplary
91-95	9.5	S	
86-90	9.0	D++	First class – Distinction
81-85	8.5	D+	
76-80	8.0	D	
71-75	7.5	A++	First Class
66-70	7.0	A+	
61-65	6.5	A	
56-60	6.0	B	Second Class
50-55	5.5	C	
Below 50	0.0	F	Fail
ABSENT	0.0	AAA	Absent

For a semester

$$\text{Grade Point Average[GPA]} = \frac{\sum C_i G_i}{\sum C_i}$$

GPA = Sum of the multiplication of Grade points by the credit of the courses / Sum of the credit of the courses in the semester

$$= \frac{\text{Sum of [Credit earned x Grade Points]}}{\text{Sum of the credits earned in the semester}}$$

For the entire programme

$$\text{Cumulative Grade Point Average [CGPA]} = \frac{\sum_n \sum_i C_{ni} G_{ni}}{\sum_n \sum_i C_{ni}}$$

= sum of the multiplication of grade points by the credits of the entire programme / Sum of the credits of the courses for the entire programme

Where

C_i - Credits earned for the course i in any semester

G_i - Grade Point earned for course i in any semester

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n - is number of all Courses successfully cleared during the particular semester in the case of GPA and during all the semesters (programme) in the case of CGPA.

CGPA	Grade	Classification of Final Result
9.6 – 10.00	S+	First class – Exemplary*
9.1 – 9.5	S	
8.6 – 9.0	D++	First class with Distinction*
8.1 – 8.5	D+	
7.6 – 8.0	D	
7.1 – 7.5	A++	First Class
6.6 – 7.0	A+	
6.1 – 6.5	A	
5.6 – 6.0	B+	Second Class
5.0 – 5.5	C	
Below 5.0	U	Reappear

* The candidates who have passed in the first appearance and within the prescribed semester

f.4 Fees Structure:

Fee Particulars	Amount in Rs.	
	First Year	Second Year
Admission Processing Fees	300	--
Course Fees	14300	14300
ICT fees	150	150
Total Fees	14,750	14,450

The above mentioned fees structure is exclusive of examination fees.

g. Requirement of the laboratory support and library resources

g.1 Laboratory Support

A well- equipment Computer Laboratory was established in the Alagappa University, Karaikudi with necessary software's as per the practical's syllabi for conducting face t o face contact sessions for practical courses of this programme. Model Practical Questions is available to the learners in the university website.

g.2 Library Resources

The Directorate of Distance Education, Alagappa University provides library facility with number of books and Self Learning materials for Computer Science programmes. The

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Central library of Alagappa University provides the collection of volumes of Self Learning Materials, Printed books, Subscriptions to printed periodicals and Non -book materials in print form for the learner's references. All these library resources are meant for learner's reference purpose only.

h) Cost estimate of the programme and the provisions:

Expense details	Amount in (Rs.) Approx.
Programme development (Single time Investment)	20,00,000/-
Programme delivery (per year)	24,00,000/-
Programme maintenance (per year)	5,00,000/-

i) Quality assurance mechanism and expected programme outcomes:

i.1 University's Moto:

' Excellence in Action'

i.2 University's Vision and Mission

Vision

Achieving Excellence in all spheres of Education, with particular emphasis on ' PEARL' - Pedagogy, Extension, Administration, Research and Learning.

Mission

Affording a High Quality Higher Education to the learners so that they are transformed into intellectually competent human resources that will help in the uplift of the nation to Educational, Social, Technological, Environmental and Economic Magnificence (ESTEEM).

i.3 University Objectives

1. Providing for instructions and training in such branches of Learning at the university may determine.
2. Fostering Research for the Advancement and Dissemination of Knowledge and Application.

i.4 Quality Policy

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Attaining Benchmark Quality in every domain of 'PEARL' to assure Stakeholder Delight through Professionalism exhibited in terms of strong purpose, sincere efforts, steadfast direction and skillful execution.

i.5 Quality Quote

Quality Unleashes Opportunities Towards Excellence (QUOTE).

i.6. Course benchmarks

The benchmark qualities of the programme may be reviewed based on the performance of students in their end semester examinations and number of enrolments of students. Feedback from the alumni, students, parents, stakeholders and employers will be received to analyze the benchmark qualities for the further improvement of the programme.

Appendix

**Detailed Syllabi
FIRST YEAR
SEMESTER I**

Course Code	Title of the Course
31311	COMPUTER ORGANIZATION AND ARCHITECTURE

Course Objectives:

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.
- To study the hierarchical memory system including cache memories and virtual memory.

Course Outcomes:

Students will have thorough knowledge about

- Basic structure of a digital computer
- Arithmetic operations of binary number system
- The organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit.

Unit No.	Contents
	BLOCK 1 : DIGITAL LOGIC CIRCUITS:
1	Introduction : Digital computers – Logic gates – Boolean algebra – Map simplification
2	Combinational circuits – Flip-flops
3	Digital Components: Integrated circuits – Decoders – Multiplexers – Registers.
	BLOCK 2 : DATA REPRESENTATION
4	Introduction : Data types – Complements – Fixed point representation – Floating point representation.
5	Register Transfer and Microoperations: Register transfer language – Register transfer – Bus and memory transfers –
6	Arithmetic microoperations – Logic Microoperations – Shift Microoperations – Arithmetic logic shift unit.

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	BLOCK 3 : BASIC COMPUTER ORGANIZATION AND DESIGN:
7	Instruction codes – Computer registers – Computer instructions – Timing and control – Instruction cycle – Memory reference Instructions – Input-output and interrupt.
8	Central Processing Unit: Introduction – General register organization – Stack organization –
9	Instruction formats – Addressing modes – Data transfer and manipulation – Program control.
	BLOCK 4 : COMPUTER ARITHMETIC
10	Introduction – Addition and subtraction – Multiplication algorithms – Division algorithms – Floating-point arithmetic operations –
11	Input-Output Organization: Peripheral devices – Input output interface – Asynchronous data transfer
12	Input-Output Organization: Modes of transfer – Priority interrupt – Direct memory Access, Input-Output Processor.
	BLOCK 5 : MEMORY ORGANIZATION
13	Memory Organization: Memory Hierarchy – Main memory – Auxiliary memory – Associative memory –
14	Other Memory: Cache memory – Virtual memory – Memory management hardware.

Text Book:

M. Morris Mano, Computer System Architecture, Prentice Hall of India Pvt Ltd, Third edition, 2002. ISBN: 81-203-0855-7.

Reference Books:

1. William Stallings, Computer Organization and Architecture – Designing for Performance, 6th Edition, Pearson Education, 2003.
2. Nicholas Carter, Schaum’s outline of Computer Architecture, Tata McGraw Hill, 2006,
3. John L. Hennessy and David A Patterson, Computer Architecture A quantitative Approach, Morgan Kaufmann / Elsevier, Fourth Edition, 2007
4. Mohammed Rafiquzzaman and Rajan Chandra, Modern Computer architecture, Galgotia Publications Pvt. Ltd., 2010
5. V.Rajaraman and T.Radhakrishnan, An Introduction to Digital computer Design, PHI Ltd, 2009.

Course Code	Title of the Course
31312	OBJECT ORIENTED PROGRAMMING AND JAVA

Course Objectives:

- To provide an overview of working principles of object oriented paradigm
- To understand and apply the OOPs fundamentals

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- To implement the features of OOP in real world applications

Course Outcome:

- Able to understand the object oriented programming techniques
- Able to implement, compile, test and run Java program,
- Able to make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API

Unit No.	Contents
	BLOCK 1 : FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING
1	Basic concepts of OOP – Benefits – Applications . Java Evolution: Features – how java differs from C and C++ - java and internet- java support system – java environment
2	Overview of Java Language –Introduction – Simple Java Program – Comments – Java Program Structure – Tokens – Java Statements – Implementing a Java Program – JVM – Command Line Arguments. Constants – Variables – Data Types – Type Casting..
3	Operators and Expressions: Arithmetic Operators – Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic Expressions, Evaluation of Expression – Precedence of Arithmetic Operators – Type Conversions – Operator Precedence and associativity – Mathematical Functions. Decision Making and Branching: If –if.....else –Nesting of if..... Else – else if–switch. Decision Making and Looping: While – do – for – jump in loops – labeled loops.
	BLOCK 2 : CLASSES, OBJECTS AND METHODS
4	class: Defining a class –fields –methods –creating objects – accessing class members – constructors – methods overloading –static members –nesting of methods – Inheritance –overriding methods –final variables-classes –methods
5	Arrays, Strings and Vectors : One dimensional Arrays –creating of array – Two dimensional arrays- strings –vectors –Wrapper classes – Enumerated Types - Interfaces: Multiple Inheritance
6	Packages: Defining interface –Extending interfaces – Implementing Interfaces - Putting Classes Together
	BLOCK 3 MULTITHREADED PROGRAMMING
7	Introduction : creating Threads –Extending the thread class –Stopping and Blocking a thread –Life cycle of a thread –using thread methods
8	Thread Exceptions –Priority –Synchronization –Implementing the ‘Runnable’ Interface
	BLOCK 4 : MANAGING ERROR, EXCEPTION AND APPLETS
9	Exceptions: Types of errors –Exceptions –Syntax of Exception Handling code –

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	Multiple Catch statements –using finally statement – Throwing our own Exceptions – using exceptions for Debugging -
10	Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.
11	Applet Programming: How applets differ from Applications – preparing to write applets – Building Applet Code – Applet life cycle – creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML file – Running the Applet – Passing parameters to Applets – Displaying Numerical values – Getting input from the user
	BLOCK 5 : MANAGING INPUT/OUTPUT FILES IN JAVA
12	Introduction – concept of streams –stream classes – byte stream classes – character Stream
13	I/O classes: –using stream –using the file class –Input / output Exceptions – creation of files – Reading / writing characters
14	Reading writing bytes: Random access files- Interactive input and output –Other stream classes

Text Books:

1. R. Krishnamoorthy and S. Prabhu, Internet and Java Programming, New Age International Publishers, 2004 (Unit I).
2. Programming with Java, 4e, E. Balagurusamy, Tata McGraw-Hill, 2010.

Reference books:

1. Deitel, Deitel and Nieto, Internet and World Wide Web – How to program, Pearson Education, 2000.
2. Naughton and H.Schildt, Java 2 - The complete reference, Tata McGraw-Hill, Fourth edition, 2006.
3. Elliotte Rusty Harold, Java Network Programming, O'Reilly Publishers, 2000.
4. B.Mohamal Ibrahim , Java : J2SE – A Practical Approach, Firewall media, 2006.
5. Cay S. Horstmann, Gary Cornell, Core Java, Volume I and II, 5th Edition, Pearson Education, 2003.
6. Topley, J2ME in A Nutshell, O'Reilly Publishers, 2002.
7. Hunt, Guide to J2EE Enterprise Java, Springer Publications, 2004.
8. Ed Roman, Enterprise Java Beans, Wiley Publishers, 1998.

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Course Code	Title of the Course
31313	DATA STRUCTURE AND ALGORITHMS

Course Objectives:

- The learner should be well versed with the fundamentals of Algorithms, learn various data structures, should be able to use them appropriately as per need during development of programs.
- Also, the learner should know different sorting and searching techniques so that correct techniques can be used in different programs so that the complexity of the program does not increase due the sorting/ search technique employed.

Course Outcome

After the completion of this course, the student will able to

- To write programs using structures, strings, arrays, pointers and strings for solving complex computational problem.
- Using the data structures real time applications
- Able to analyze the efficiency of Data Structures

Unit No	Contents
	BLOCK 1 : INTRODUCTION
1	Introduction to Data Structure : Types of Data Structure , Primitive data types Algorithms: –Time and space Complexity of algorithms
2	Arrays: Array initialization, Definition of Array, Characteristic of Array ,One-dimensional Array, Two-dimensional array and Multi dimensional array
	BLOCK 2 : LINEAR DATA STRUCTURE
3	Stack : Stack related terms, Operations on a stack,
4	Representation of Stack: Implementation of a stack – application of Stack. Expression Evaluation Polish notation.
5	Queues: Operations on queue Circular Queue, Representation of Queues, Application of Queues
6	List: Merging lists, Linked list, Single linked list, Double Linked List, Header Linked list
7	Operation on Linked List : Insertion and Deletion of linked list
8	Traversal: Traversing a linked list , Representation of linked list.
	BLOCK : 3 NON-LINEAR DATA STRUCTURE
9	Trees: Binary Trees, Types of Binary trees, Binary Tree Representation
10	Binary Tree operations / Applications : Traversing Binary Trees, Binary Search tree,
11	Operations on Binary Tree: Insertion and Deletion operations, Hashing Techniques.

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	BLOCK 4 : SEARCHING TECHNIQUES
12	Searching : Introduction, Searching, Linear Search, Binary Search
	BLOCK 5 : SORTING TECHNIQUES
13	Sorting: Bubble sort, Insertion sort, Radix sort
14	Other sorting Techniques: Selection sort, Quick sort, Tree sort.

Text Books:

1. Fundamentals of Data structures, Second edition, Ellis Horowitz and Sartaj Sahini, Universities press, 2007.
2. Data Structures, Seymour Lipschutz, G.A.Vijayalakshmi Pai, Second Edition , Schaum's Outlines, Tata Mc-Graw Hill Private Ltd., 2006.

Reference Books:

1. Programming and Data Structure, Pearson Edition, Ashok N Kamthane, 2007.

Course Code	Title of the Course
31314	OBJECT ORIENTED PROGRAMMING AND JAVA LAB

Course Objective:

- To understand the basic concepts of Object Oriented Programming
- To understand console and internet programming (applets) using Java

Course Requirement:

- Basic concepts of Web and Java programming

Course Outcome:

- Explore markup languages features and create interactive web pages using them
- Able to design front end web page and connect to the back end databases.
- Able to do Object oriented programming to solve the problems

Experiments based on Internet Programming Theory

Unit No.	Contents
	BLOCK 1 : JAVA FUNDAMENTAL PROBLEMS:

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1	Simple Java Problems
2	class and objects
3	Conditional control using java
4	Looping using java
	BLOCK 2 : OOP CONCEPTS
5	Function overloading programs
6	Operator overloading programs
7	Inheritance programs, Packages
8	Polymorphism programs Message passing programs
	BLOCK 3 : THREAD & VIRTUAL FUNCTION
9	Threads
10	Virtual function programs
	BLOCK 4 : I/O AND EXCEPTION HANDLING
11	Exception handling programs
12	I/O manipulation programs,
	BLOCK 4 :NETWORK PROGRAMMING
13	Applet programs
14	Implementation of simple network programs using java

Reference books:

1. R. Krishnamoorthy and S. Prabhu, Internet and Java Programming, New Age International Publishers, 2004 (Unit I).
2. Programming with Java, 4e, E. Balagurusamy, Tata McGraw-Hill, 2010.
3. Deitel, Deitel and Nieto, Internet and World Wide Web – How to program, Pearson Education, 2000.
4. Naughton and H.Schildt, Java 2 - The complete reference, Tata McGraw-Hill, Fourth edition, 2006.
5. Elliotte Rusty Harold, Java Network Programming, O'Reilly Publishers, 2000.
6. B.Mohamal Ibrahim , Java : J2SE – A Practical Approach, Firewall media, 2006.
7. Cay S. Horstmann, Gary Cornell, Core Java, Volume I and II, 5th Edition, Pearson Education, 2003.
8. Topley, J2ME in A Nutshell, O'Reilly Publishers, 2002.
9. Hunt, Guide to J2EE Enterprise Java, Springer Publications, 2004.
10. Ed Roman, Enterprise Java Beans, Wiley Publishers, 1998.

SEMESTER II

Course Code	Title of the Course
31321	DATA MINING AND WAREHOUSING

Course Objective:

- This course presents on depth of to data mining techniques; association rule, clustering, classification, web mining, temporal and sequential data mining and provide a practical exposure using data mining tool orange.
- To enable the students to learn the basic functions, principles and concepts of Data Mining
- To understand the fundamentals of Big Data Analytics

Course Requirements:

- Basic Concepts of Database

Course Outcome:

On successful completion of the course the students should have:

- Understand the data mining techniques, classification and web mining

Unit No.	Contents
	BLOCK 1 : DATA MINING AND WAREHOUSING INTRODUCTION
1	Data Warehousing Introduction – Definition-Architecture-Warehouse Schema-Warehouse server-OLAP operations. Data Warehouse technology – Hardware and operating system
2	Data Mining - Definition – DM Techniques – current trends in data mining - Different forms of Knowledge – Data selection, cleaning, Integration, Transformation, Reduction and Enrichment.
3	Data: Types of data - Data Quality - Data Preprocessing - Measures of similarity and dissimilarity. Exploration: Summary statistics – Visualization.
	BLOCK 2 : ASSOICATION RULE MINING AND CLASSIFICATION
4	Association rules: Introduction – Methods to discover association rule – Apriori algorithm Partition Algorithm
5	AR Algorithms: Pincher search algorithm – Dynamic Item set algorithm – FP Tree growth algorithm.
6	Classification: Decision Tree classification – Bayesian Classification – Classification by Back Propagation.
	BLOCK 3 : CLUSTERING TECHNIQUES AND MACHINE LEARNING
7	Introduction – Clustering Paradigms – Partitioning Algorithms – K means & K Mediod algorithms – CLARA – CLARANS – Hierarchical clustering – DBSCAN – BIRCH – Categorical Clustering algorithms – STIRR – ROCK – CACTUS.
8	Introduction to machine learning – Supervised learning – Unsupervised

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	learning – Machine learning and data mining.
9	Neural Networks: Introduction – Use of NN – Working of NN Genetic Algorithm: Introduction –Working of GA.
BLOCK 4 : WEB MINING AND VISUAL DATA MINING	
10	Introduction –Web content mining – Web structure mining –Web usage mining –Text mining –Text clustering, Temporal mining -Spatial mining
11	Visual data mining – Knowledge mining – Various tools and techniques for implementation using weka, Rapidminer and Matlab.
BLOCK 5 : INTRODUCTION TO BIG DATA ANALYTICS	
12	Big Data Characteristics- Types of Big Data- Traditional Versus Big Data Approach
13	Technologies Available for Big Data
14	Hadoop – Introduction - What is Hadoop? - Core Hadoop Components - Hadoop Ecosystem - Physical Architecture - Hadoop Limitations

Text Books:

1. Arun K Pujari, “Data Mining Techniques”, University press, 2008.
2. C S R Prabhu, “Data Warehousing – concepts, techniques and applications “, 2nd Edition, Prentice Hall of India, 2002.
3. Radha Shankarmani, M Vijayalakshmi, “Big Data Analytics”, Wiley Publications, first Edition, 2016

Reference Books:

1. Jaiwei Han, Michelle Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman publishers, 2008.
2. Alex Berson, Stephen J.Smith , “Data Warehousing , Data Mining & OLAP”, Tata McGraw Hill, 2004.
3. Seema Acharya, Subhashini Chellappan, “Big Data and Analytics”, Wiley Publication, first edition. Reprint in 2016
4. DT Editorial Services, “Black Book- Big Data (Covers Hadoop 2, MapReduce, Hive, Yarn, PIG, R, Data visualization)”, Dream tech Press edition 2016.

Course Code	Title of the Course
31322	RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

Course Objectives:

- To understand the fundamentals of data models
- To make a study of SQL and relational database design.

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- To know about data storage techniques and query processing.
- To impart knowledge in transaction processing, concurrency control techniques and External storage

Course Requirements:

- Knowledge about the basic concepts of the database.

Course Outcome:

- Design a database using ER diagrams and map ER into Relations and normalize the relations
- Acquire the knowledge of query evaluation to monitor the performance of the DBMS.
- Develop a simple database applications using normalization.

Unit No	Contents
	BLOCK 1 INTRODUCTION
1	Data base System Applications , data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model
2	Model :Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor.
3	History of Data base Systems - Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.
	BLOCK 2 : RELATIONAL MODEL
4	Introduction – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying / altering Tables and Views.
5	Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews –
6	Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.
	BLOCK 3 : SQL QUERY
7	Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases. Schema refinement
8	Normal forms :Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND,

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	THIRD Normal forms – BCNF–
9	Join: Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.
	BLOCK 4 TRANSACTION
10	Introduction : Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability
11	Protocols : Lock Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.
12	Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems
	BLOCK 5 STORAGE
13	Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and
14	Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Text Books:

1. Raghurama Krishnan, Johannes Gehrke, Data base Management Systems, 3rd Edition, TATA McGrawHill.2003.
2. Silberschatz, Korth, Data base System Concepts, 6th Edition, Tata McGraw Hill, 2011.

Reference Books:

1. Relational Database Principles 2nd Edition, Colin Ritchie, 2004
2. Sharad Maheswari and Ruchin Jain, Database management systems Complete Practical Approach, Firewall media, 2006
3. Peter Rob & Carlos Coronel, Data base Systems design, Implementation, and Management, 7th Edition.
4. Elmasri Navrate , Fundamentals of Database Systems, Pearson Education.

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Course Code	Title of the Course
31323	VISUAL PROGRAMMING WITH •NET

Course Objective:

To develop an understanding of Visual Basic .Net

To develop the skills necessary to create software solutions using VB with .Net

To learn how to analyze certain types of problems with a software solution in mind

Course Requirements:

- Basic knowledge of Visual Basic

Course Outcome:

- Able to understand and design the solution to a problem using VB. Net
- Understand and implement the features of .Net for providing programmed solutions to complex problems

Unit No	Contents
	BLOCK 1 : INTRODUCTION
1	Introduction - What Is Visual Studio ? - Navigating the Visual Studio - The Menu – Toolbar - Work Area
2	Toolbox - Solution Explorer - Status Bar - Managing VS Windows
3	Visual Studio Project Types - Windows Projects - Web Projects - Office Projects - SharePoint Projects - Database Projects
	BLOCK 2 : C# AND VB.NET
4	Basic Syntax - Code Skeleton - The Main Method - The Program Class - The First Program Namespace - VS Code Editor - Class and Member Locators – Bookmarks - Running Programs - Primitive Types and Expressions - Enums - Branching Statements - Loops
5	Creating Classes - Class Inheritance – Class Snippet - Writing Methods - Parameters Passing - Returning Data
6	Method Snippets - Coding Fields and Properties - Declaring and Using Properties - The Property Snippet
	BLOCK 3 : UNDERSTANDING DELEGATES AND EVENTS
7	Events - Delegates - Handler Code - Implementing Interfaces - The interface Snippet - Applying Arrays and Generics -
8	Creating and Building Projects - Constructing Solutions and Projects - Navigating the Solution Explorer - Examining Property Settings - Assembly

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	Name - Default Namespace - Target Framework - Output Type
9	Building Projects :Startup Object - Icon and Manifest - Compiling Applications - Rebuilding Solutions/Projects - Cleaning Solutions/Projects - Managing Dependencies, Compilation Settings - Navigating with Class View - Using the Class Designer - Class Designer Code Generation
	BLOCK 4 : DEBUGGING WITH VISUAL STUDIO
10	Debugging methods: Breakpoints - Stepping Through Code – Inspecting Application State - Locals and Autos Windows - Watch Windows - The Immediate Window - The Call Stack Window - The Quick Watch Window - Watching Variables with Pin To Source - Working with IntelliTrace
11	Working with Databases - Server Explorer - Creating a Database - Adding Tables - Relating Tables with Foreign Keys - Adding Stored Procedures - Configuring Database Options
	BLOCK 5 : BUILDING PROGRAMS WITH VS 2010
12	Building Desktop Applications with WPF - Starting a WPF Project - Understanding Layout - Grid Layout - StackPanel Layout - DockPanel Layout - WrapPanel Layout - Canvas Layout
13	Using WPF Controls - Managing Windows for Controls - Setting Properties - Handling Events - Coding Event Handlers - Working with Data in WPF - Data Source - Configuring a ComboBox
14	Reading and Saving Data - Using the DataGrid - Summary -Creating Web Applications with ASP.NET MVC - Designing Silverlight Applications - Deploying Web Services with WCF

Text Book:

1. Joe Mayo, Visual Studio 2010 - A Beginner's Guide, Tata Mc Graw Hill Edition, 2010.

Reference Books:

1. Nick Randolph, David Gardner, Professional Visual Studio 2010, Wiley Publishing 2010.
2. Andrew Moore, Visual Studio 2010 All-in-One For Dummies, Weiley Publishing, 2010.

Course Code	Title of the Course
31324	VB ●.NET & RDBMS LAB

Course Objective:

To develop an understanding of Visual Basic .Net

To develop the skills necessary to create software solutions using VB with .Net

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To learn how to analyze certain types of problems with a software solution in mind

Course Requirements:

- Basic knowledge of Visual Basic

Course Outcome:

- Able to understand and design the solution to a problem using VB. Net
- Understand and implement the features of .Net for providing programmed solutions to complex problems

Experiments based on Visual Programming with .NET Theory

Unit No.	Contents
	BLOCK 1 : SIMPLE APPLICATIONS
1	Simple Applications: Developing simple applications using VB.NET <ol style="list-style-type: none"> a. Finding factorial Value b. Money Conversion c. Quadratic Equatin d. Temperature Conversion e. Login control
2	Login form: Create and Validate Login Form, Program to design Class, Program to demonstrate Inheritance, Polymorphism and Interfaces.
	BLOCK 2 : CONTROLS
3	Controls: Advance Controls, Common Dialog Controls. <ol style="list-style-type: none"> 2. Adrotator Control 3. Calendar control <ol style="list-style-type: none"> a. Display messages in a calendar control b. Display vacation in a calendar control c. Selected day in a calendar control using style d. Difference between two calendar dates 4. Treeview control a) Treeview control and datalist b) Treeview operations 5. Validation controls
4	Active X Controls: Working with intrinsic controls and ActiveX controls
	BLOCK 3 : MDI AND DATA CONTROLS
5	MDI: Application with multiple forms
6	Data controls: Application using data controls
	BLOCK 3 : DIALOGS AND MENU
7	Dialogs: Application with dialogs
8	Common Dialogs: Application using Common Dialogs
9	Menus: Application with Menus
	BLOCK 4 : EVENTS AND DATABASE
10	Events and Database: Drag and Drop Events Database Management Creating

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	ActiveX Controls
11	DataGridView: ADO.NET Code to show records in DataGridView Control. 1. Databinding using datalist control 2. Datalist control templates 3. Databinding using datagrid 4. Datagrid control template 5. Datagrid hyperlink 6. Datagrid button column 7. Datalist event 8. Datagrid paging
12	Database operations: ADO.NET Code to perform Insert, Delete, Update and Select operations. Crystal Reports Web Application using ASP.NET that uses validation controls. Table creation, Renaming a Table, Copying another table, Dropping a Table Table Description: Describing Table Definitions, Modifying Tables, Joining tables, Number and Date functions.
	BLOCK 5 : SQL QUERIES AND SUB QUERIES
13	SQL Queries: Queries, Sub Queries, and aggregate functions DDL: Experiments using database DDL SQL statements DML: Experiment using database DML SQL statements DCL: Experiment using database DCL SQL statements
14	APPLICATION DEVELOPMENT : Design and Develop Application: Library information system, Students mark sheet processing, Telephone directory maintenance, Gas booking and delivering, Electricity bill processing, Bank Transaction, Pay roll processing. Personal information system, Question database and conducting Quiz and Personal diary

Reference Books:

1. Joe Mayo, Visual Studio 2010 - A Beginner's Guide, Tata Mc Graw Hill Edition, 2010.
2. Nick Randolph, David Gardner, Professional Visual Studio 2010, Wiley Publishing 2010.
3. Andrew Moore, Visual Studio 2010 All-in-One For Dummies, Wiley Publishing, 2010.

SECOND YEAR SEMESTER III

Course Code	Title of the Course
31331	OPEN SOURCE SOFTWARE

Course Objectives:

- To understand the need, advantages and applications of open source software
- To work with open source database and open source programming languages

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Course Outcome

- Attained to know and work with open source software like Linux, MySql etc
- Able to do programming in open source programming languages

Unit No.	Contents
	BLOCK 1 : INTRODUCTION
1	Introduction to Open sources – Need of Open Sources – Advantages of Open Sources–Application of Open Sources.
2	Open source operating systems: LINUX: Introduction– General Overview– Kernel Mode and user mode–Process–
3	Advanced Concepts–Scheduling – Personalities – Cloning – Signals – Development with Linux. .
	BLOCK 2 : OPEN SOURCE DATABASE
4	MySQL: Introduction Setting up account Starting, terminating and writing your own SQL programs
5	Record selection Technology– Working with strings – Date and Time
6	Sorting Query Results – Generating Summary – Working with metadata – Using sequences – MySQL and Web.
	BLOCK 3 :OPEN SOURCE PROGRAMMING LANGUAGE - PHP
7	PHP: Introduction – Programming in web environment – variables – constants–data types – operators –Statements
8	Functions– Arrays – OOP –String Manipulation and regular expression –File handling and data storage
9	PHP and SQL database – PHP and LDAP – PHP Connectivity –Sending and receiving E-mails –Debugging and error handling – Security – Templates.
	BLOCK 4 :OPEN SOURCE PROGRAMMING LANGUAGE - PYTHON
10	Syntax and Style – Python Objects – Numbers – Sequences – Strings –Lists and Tuples – Dictionaries –Conditionals and Loops .
11	Files – Input and Output –Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment.
	BLOCK 5 :OPEN SOURCE PROGRAMMING LANGUAGE - PERL
12	Perl backgrounder – Perl overview– Perl parsing rules – Variables and Data – Statements
13	Control structures – Subroutines
14	Packages, and Modules-Working with Files –Data Manipulation.

Text Books:

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002

Books for Reference:

1. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002

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2. Wesley J. Chun, “Core Python Programming”, Prentice Hall, 2001
3. Martin C. Brown, “Perl: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
5. Vikram Vaswani, “MYSQL: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

Course Code	Title of the Course
31332	OPERATING SYSTEM

Course Objective

- Able to understand the operating system principles
- Able to know the Principles of Deadlock, processor scheduling and memory management.

Course Requirements:

- To be aware of the evolution and fundamental principles of operating system, processes and their communication

Course Outcome

- Students have acquired the knowledge about the types of operating systems
- Students have acquired the knowledge about the functions of operating system

Unit No.	Contents
	BLOCK 1 : INTRODUCTION
1	Introduction: Definition of Operating Systems – Computer System Organization
2	Computer System Architecture – Operating System Structure – Operating System Operations
3	System Structures: Operating System Services – System Calls – System Programs – Operating System Design and Implementation.
	BLOCK 2 : PROCESS CONCEPT
4	Process Concept: Process Scheduling – Operations on Processes – Inter Process Communication
5	Process Scheduling: Scheduling Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling
	BLOCK 3 : SYNCHRONIZATION
6	Synchronization: The Critical Section Problem – Synchronization Hardware –

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	Semaphores – Classic Problems of Synchronization – Monitors
7	Deadlocks: Deadlocks Characterization – Methods for Handling Deadlocks
8	Deadlock Prevention – Avoidance – Detection –Recovery from Deadlock.
	BLOCK 4 : MEMORY MANAGEMENT
9	Memory Management Strategies: Swapping – Contiguous Memory Allocation – Paging – Segmentation
	BLOCK 5 : FILE SYSTEM
10	File Concept – Access Methods – Directory
11	Structure – File System Mounting – File Sharing – Protection.
12	Implementing File Systems: File System Structure – File System Implementation
13	Directory Implementation – Allocation Methods – Free Space Management
14	Secondary Storage Structure: Overview of Mass Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Principles”, 7th Edition, Wiley India Edition, 2008.

REFERENCE BOOKS:

1. Andrew S.Tanenbaum, Operating Systems Design and Implementation, 3rd edition, Prentice Hall, 2006.
2. Harvey M. Deitel, An Introduction to Operating Systems, 3rd Edition, Addison Wesley 2007.

Course Code	Title of the Course
31333	COMPUTER NETWORKS

Course Objectives:

- To understand networking concepts and basic communication model
- To understand network architectures and components required for data communication.

Course Requirements:

- Basic knowledge of networking

Course Outcome:

- Able to understand the working principles of various application protocols
- Acquire knowledge about security issues and services available

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Unit No.	Contents
	BLOCK 1 : INTRODUCTION & PHYSICAL LAYER
1	Introduction; Computer Networks - Applications - Line configuration - Topology - Transmission Modes
2	Categories of Network: LAN, MAN, WAN - OSI Layer.
3	Physical Layer: Analog and Digital Signals Performance - Transmission Media
	BLOCK 2 : DATA LINK LAYER
4	Data Link Layer: Error Detection and correction – Introduction – Block Coding – Cyclic Redundancy Check – Framing – Flow and error Control –
5	Data link layer protocols: stop - wait protocol and sliding window protocol - ARQ, Go-back-n ARQ, selective - repeat ARQ.
6	Multiple Access Protocols: ALOHA – CSMA – CSMA/CD – CSMA/CA.
	BLOCK 3 : NETWORK LAYER
7	Introduction: Circuit switching - packet switching - message switching - Virtual circuit and Datagram subnets
8	Routing algorithm : Static routing -shortest path routing, Flooding, Flow based routing - Dynamic routing - distance vector routing, link state routing
9	Other Routing Algorithms: Hierarchical routing, Broad cast, Multi cast routing - Congestion, Control Algorithms
	BLOCK 4 : TRANSPORT LAYER
10	Introduction: Process to process delivery – UDP – TCP - Connection oriented Vs connectionless services.
11	Applications and services: Domain name system - Remote Logon – Mail Exchange - File Transfer
12	Remote Procedure Call - Remote File Access – WWW and HTTP – SNMP.
	BLOCK 5 : NETWORK SECURITY
13	Introduction: Cryptography – Encryption model – Transposition and Substitution Chipers – Cryptographic principles
14	Symmetric key cryptography: DES – AES – Asymmetric key cryptography: RSA – Security services.

Text Books:

- 1.Computer Networks, 3rd Edition, Andrew S Tanenbaum, Pearson Education, 2010.
- 2.Data Communications and Networking, 4th Edition, Behrouz A. Forouzan, TMH, 2009.

Reference Books:

1. Data and Computer Communications, 8th Edition, William Stallings, Prentice Hall.
2. An Engineering Approach to Computer Networks, 2nd Edition, S.Keshav, Pearson Education, 2008

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Course Code	Title of the Course
31334	OPEN SOURCE LAB

Course Objectives:

- To understand the need, advantages and applications of open source software
- To work with open source database and open source programming languages
- To develop applications in PHP using various concepts like arrays, udf's, Sessions and make the students to understand and to establish the connectivity between PHP and MySQL and develop programs to add records, retrieve records and delete records from a table.

Course Outcome

- Attained to know and work with open source software like Linux, MySql etc.,
- Able to do programming in open source programming languages.

Unit No.	Contents
	BLOCK 1 : INTRODUCTION TO LINUX
1	Kernel configuration, compilation and installation.
2	Install various software on Linux. Install and configure XAMP., Unix commands And shell programming
	BLOCK 2 : MYSQL
3	Creating simple table with constraints Insertion, Updation and Deletion of rows in MYSQL tables Searching of data by different criteria,Sorting of data
4	Demonstration of joining tables Usage of subqueries,aggregate functions Working with set operators Working with string, numeric and date functions
5	Database connectivity in PHP with MySQL Validating Input Formatting the Output.
	BLOCK 3 : PHP
6	PHP Simple Programs PHP program to perform the arithmetic operation. PHP program Adding numbers using function.
7	PHP Web programs arrays and functions Creating simple webpage using PHP Use of conditional statements in PHP Use of looping statements in PHP Creating different types of arrays

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	Usage of array functions Creating user defined functions
8	File manipulation using PHP Creation of files,sessions and cookies Creating simple applications using PHP Creating simple table with constraints
	BLOCK 4 : PERL AND PYTHON PROGRAMMING
9	PERL programs : Simple programs using PERL
10	Python Programming: Use of conditional statements Use of looping statements
11	Python Programming: Arrays Creating different types of arrays Usage of array functions Creating user defined functions
12	Python Programming: String: String Handling
	BLOCK 5 : APPLICATION DEVELOPMENT
13	Connect to a MYSQL database with PHO, PERL and Python.
14	Developing simple applications using PHP and MYSQL

Books for Reference:

- Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003
- Steve Suchring, “MySQL Bible”, John Wiley, 2002.
- Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002.
- Wesley J. Chun, “Core Python Programming”, Prentice Hall, 2001
- Martin C. Brown, “Perl: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
- Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
- Vikram Vaswani, “MYSQL: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009

SEMESTER IV

Course Code	Title of the Course
31341	WEB TECHNOLOGY

Course Objective:

- To understand and practice markup languages
- To understand and practice embedded dynamic scripting on client side Internet Programming
- To understand and practice web development techniques on client-side

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Course Requirement:

Basic concepts of Web and Java programming

Course Outcome:

Explore markup languages features and create interactive web pages using them

Learn and design Client side validation using scripting languages

Acquire knowledge about Open source JavaScript libraries

Able to design front end web page and connect to the back end databases.

Unit No.	Contents
	BLOCK 1 : HTML, JAVA SCRIPT and XML
1	HTML Common tags: List, Tables, images, forms, Frames; Cascading Style sheets.
2	Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.
3	XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX
	BLOCK 2 : JAVA BEANS
4	Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDk, Introspection, Using Bound properties, Bean Info Interface,
5	Constrained properties, Persistence, Customizes, Java Beans API, Introduction to EJB's
	BLOCK 3 : SERVLETS
6	Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK
7	The Servlet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization parameters.
8	The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.
	BLOCK 4 : JAVA SERVER PAGES (JSP)
9	Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.
10	JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods
11	Error Handling and Debugging: Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations
	BLOCK 5 : DATABASE ACCESS AND STRUCTS FRAMEWORK
12	Database Access: Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page
13	Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page
14	Introduction to struts framework.

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TEXT BOOK:

1. Chris Bates, Web Programming, Building Internet Applications, 2nd Edition, Dreamtech
2. Patrick Naughton and Herbert Schildt, The complete Reference Java 2, 5th Edition, Tata McGraw Hill.
3. Jason Hunter Java Servlet Programming, O'Reilly
4. Hans Bergsten, Java Server Pages, O'Reilly

REFERENCE BOOK:

1. Ramesh Bangia, Web Technology, Firewall media, 2006.

Course Code	Title of the Course
31342	SOFTWARE ENGINEERING

Course Objective:

- To know of how to do project planning for the software process.
- To learn the cost estimation techniques during the analysis of the project.
- To understand the quality concepts for ensuring the functionality of the software

Course Requirement:

- Fundamental concepts of Software Engineering

Course Outcome:

- Understand the activities during the project scheduling of any software application.
- Learn the risk management activities and the resource allocation for the projects.
- Able to create reliable, replicable cost estimation that links to the requirements of project planning and managing.

Unit No.	Contents
	BLOCK 1 : INTRODUCTION
1	Software: Role of software, Software myths. Generic view of process: A layered technology, a process framework, The Capability Maturity Model Integration (CMMI)
2	Process patterns, Process assessment, Personal and Team process models.
3	Process model: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.
	BLOCK 2 : REQUIREMENT ENGINEERING:
4	Design and Construction, Requirement Engineering Tasks, Requirements Engineering Process, Validating Requirements.
5	Building the Analysis Model: Requirement analysis, Data Modeling concepts, Object-Oriented Analysis

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6	Modeling: Scenario-Based Modeling, Flow-Oriented Modeling Class-Based Modeling, Creating a Behavioral Model.
BLOCK 3 : DESIGN	
7	Design Engineering: Design process and quality, Design concepts, the design model.
8	Architectural Design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.
9	User interface design: The Golden rules, User interface analysis and design, Interface analysis, Interface design steps, Design evaluation.
BLOCK 4 : TESTING	
10	Testing Strategies: Approach to Software Testing, Unit Testing, Integration Testing, Test strategies for Object-Oriented Software, Validation Testing, System Testing, the art of Debugging, Black-Box and White-Box testing.
11	Product Metrics: Software Quality, Product Metrics, Metrics for Analysis Model, Design Model, Source code and Metrics for testing, Metrics for maintenance. Metrics for Process and Projects Domains: Software Measurement, Metrics for Software Quality and Software Process.
BLOCK 5 : RISK and QUALITY MANAGEMENT	
12	Risk Strategies: Reactive vs. Proactive Risk strategies, software risks, Risk identification
13	Risk Protection and refinement: Risk projection, Risk refinement, Risk Mitigation, Monitoring and Management, RMMM Plan.
14	Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal Technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOK:

1. Roger S. Pressman Software Engineering - A practitioner's Approach McGraw-Hill 6th Edition (2010)

REFERENCE BOOKS:

1. Richard Fairlay Software Engineering Concepts McGraw Hill Book Company (2005)
2. Pankaj Jalote An Integrated Approach to Software Engineering Narosa Publishing House 3rd Edition (2005)
3. Software Engineering, Somzerville, 8th Edition, Pearson Education 2007.
4. Software Engineering K.K. Agarwal & Yogesh Singh, 3rd Edition New Age International Publishers 2007.
5. Software Engineering an Engineering Approach James F. Peters, Witold Pedrycz - John Wiley & Sons 2000.
6. Software Engineering Principles and Practice Waman S Jawadekar, , Tata McGraw-Hill 2004.

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Course Code	Title of the Course
31343	CLOUD COMPUTING

Course Objective:

Lets learner to understand how to access all applications and documents from everywhere in the world, freeing from the confines of the desktop and making it easier for group members in different locations to collaborate.

Course Requirements:

Basic knowledge about internet and its application.

Course Outcome:

Understood the importance of cloud computing and its services.

Unit No.	Contents
	BLOCK 1 : INTRODUCTION
1	Fundamentals :Cloud Computing – History – Working of cloud computing – Cloud computing today – Pros and cons of Cloud Computing – Benefits of cloud computing
2	Non users of Cloud computing – Developing cloud services – Pros and Cons of Cloud service Development
3	Types of Cloud Service Development – Discovering Cloud Services development services and tools.
	BLOCK 2 : CLOUD COMPUTING FOR EVERYONE
4	Centralizing Email Communications – Collaborating of Grocery lists – Collaborating on To-Do lists –
5	Collaborating on Household budgets – Collaborating on Contact lists – Communicating across the community – Collaborating on Schedules
6	Collaborating on group projects and events – Cloud computing for corporation.
	BLOCK 3 : CLOUD SERVICES
7	Exploring online calendar applications – Exploring online scheduling applications – Exploring online planning and task management – Collaboration on event management –
8	Collaboration on Contact Management – Collaboration on Project Management –
9	Collaborating on Word Processing and Databases – Storing and Sharing files and other online content.
	BLOCK 4 : ISSUES IN CLOUD
10	Federation in cloud – Four levels of federation – Privacy in cloud
11	Security in Cloud –Software as a security service – Case Study: Aneka – service

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	level agreements
12	Cloud Storage: Over view of cloud storage – Cloud storage providers – Amazon S3 – Cloud file system – Map Reduce – Hadoop
	BLOCK 5 : CLOUD DEPLOYMENT TOOLS:
13	Study of open source cloud platforms – Eucalyptus
14	Nimbus – Open Nebula

Text Books:

1. Michael Miller, “Cloud computing – Web based applications that change the way you work and collaborate online”, Pearson Education Inc., 2008
2. John W.Rittinghous, James F.Ransome, “Cloud Computing: Implementation, Management and Security”, CRC Press 2010.

Books for Reference:

1. Danielle Ruest and Nelson Ruest, “Virtualization: A Beginners’s Guide”, McGraw Hill,2009.
2. Tom White, “Hadoop: The Definitive Guide”, O’RIELLY Media 2009.
3. Rajkumar Buyya, James Broberg, Andrej Goscinski, “Cloud computing – Principles and Paradigms”, John Wiley and Sons, 2011.

Course Code	Title of the Course
31344	WEB TECHNOLOGY LAB

Course Objective:

- To understand and practice markup languages
- To understand and practice embedded dynamic scripting on client side Internet Programming
- To understand and practice web development techniques on client-side

Course Requirement:

- Basic concepts of Web and Java programming

Course Outcome:

- Explore markup languages features and create interactive web pages using them
- Learn and design Client side validation using scripting languages
- Acquire knowledge about Open source JavaScript libraries
- Able to design front end web page and connect to the back end databases.

Experiments based on Web Technology Theory

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Unit No.	Contents
	BLOCK 1 : HTML and JAVASCRIPT
1	HTML Common tags: List, Tables, images, forms, Frames; Cascading Style sheets.
2	Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.
3	DHTML programs
	BLOCK 2: XML and JAVA BEANS
4	XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX
5	Simple programs using XML
6	Simple applications using Java Beans : setting and getting properties of beans
	BLOCK 3 : JAVA SERVLETS PROGRAMMING
7	Simple Server side programs: Example. Write Servlet program to send Email message.
8	Session Handling
9	Cookies : getting and setting cookies
	BLOCK 4 : JAVA SERVER PAGES
10	Write a JSP program using JDBC. Shopping cart problem
11	Develop an Application for JSP – Servlet communication
12	Deploying JAVA Beans in a JSP Page
	BLOCK 5 : DATABASE ACCESS
13	Database Programming using JDBC
14	Accessing a Database from a JSP Page , Simple database applications with create, insert, modify and delete records. Batch Update. Stored Procedure and callable statement.

REFERENCE BOOK:

1. Chris Bates, Web Programming, Building Internet Applications, 2nd Edition, Dreamtech
2. Patrick Naughton and Herbert Schildt, The complete Reference Java 2, 5th Edition, Tata McGraw Hill.
3. Jason Hunter Java Servlet Programming, O'Reilly
4. Hans Bergsten, Java Server Pages, O'Reilly .
5. Ramesh Bangia, Web Technology, Firewall media, 2006

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**MINUTES OF THE MEETING OF THE BOARD OF STUDIES FOR MASTER OF
SCIENCE (INFORMATION TECHNOLOGY) – M.Sc(IT) PROGRAMME**

M.Sc(IT) Credit Based Curriculum and Evaluation System


Minutes of the Meeting of the Board of Studies in Computer Science for the Master of Computer Applications (M.C.A), M.Sc(Information Technology), M.Sc. (Computer Science), Post Graduate Diploma in Computer Applications (P.G.D.C.A), Bachelor of Computer Applications (B.C.A), B.Sc (Information Technology), B.Sc. (Computer Science) Programmes to be offered through Open Distance Learning (ODL) Mode held at The Directorate of Distance Education, Alagappa University, Karaikudi – 630 003, on 04.09.2017, (11.00 A.M).

Members Present


1.	Dr. V Palanisamy	-	Chairman
2.	Dr. E.Ramaraj	-	Member
3.	Dr. K.Kuppusamy	-	Member
4.	Dr. T.Meyyappan	-	Member
5.	Dr. S.S.Dhenakaran	-	Member
6.	Dr. K.Mahesh	-	Special Invitee
7.	Dr. A. Padmapriya	-	Special Invitee
8.	Dr. P. Prabhu	-	Member
9.	Mr. S. Balasubramanian	-	Member

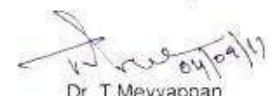
After the deliberation and discussion the board resolved the following:

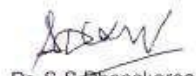
1. The Board considered the curriculum design and detailed syllabi of Computer Science programmes, prepared as per the norms and the Board scrutinized and necessary modifications are specified.
2. The Board resolved to approve curriculum design, detailed syllabi and other regulations for the Master of Computer Applications (M.C.A), M.Sc(Information Technology), M.Sc. (Computer Science), Post Graduate Diploma in Computer Applications (P.G.D.C.A), Bachelor of Computer Applications (B.C.A), B.Sc (Information Technology), B.Sc. (Computer Science) programmes to be offered from 2018-2019 academic year onwards by the Directorate of Distance Education of Alagappa University, Karaikudi.

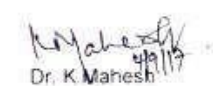

Dr. V. Palanisamy

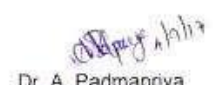

Dr. E. Ramaraj

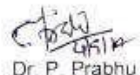

Dr. K. Kuppusamy



Dr. T. Meyyappan


Dr. S.S. Dhenakaran


Dr. K. Mahesh


Dr. A. Padmapriya


Dr. P. Prabhu


Mr. S. Balasubramanian