

ALAGAPPA UNIVERSITY

(A State University Accredited with A+ Grade by NAAC (CGPA: 3.64) in the Third Cycle)
Karaikudi, Tamilnadu, India

DIRECTORATE OF DISTANCE EDUCATION

PROGRAMME PROJECT REPORT for M.Sc (Computer Science)



Submitted to
UGC, DISTANCE EDUCATION BUREAU (DEB)
New Delhi

For seeking approval to introduce new programme through Distance
Education Mode

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ALAGAPPA UNIVERSITY, KARAIKUDI
DIRECTORATE OF DISTANCE EDUCATION
MASTER OF COMPUTER SCIENCE (M.Sc)
Credit Based System (CBS)
(With effect from June 2018-2019 Onwards)

(a) Programme's Mission and Objectives

Mission

The mission for M.Sc. Computer Science, to meet the twin objectives one for research and the other is to improving the potential for suitable placements in the industry. The M.Sc. course provides in-depth understanding of core and advanced topics in the subject. In the final semester, students take up and complete a project in the design and development of software. This course is to offer excellent career opportunities in various industries including software development companies in the areas of System analysis/design/developments/supports.

Programme Objectives:

- To train students for careers in research and in the software industry
- To enable students to work on a project in collaboration with well-established software development organizations and acquire demonstrable experience in the design, development and documentation of a software product of significant size and complexity
- To develop problem-solving skills, and to encourage students to communicate effectively
- Discover, analyze, investigate the requirements of a problem and find the solution using computers.

Programme Outcome:

- The programme will enable the students to develop software solutions to real world enterprises through IT with international standards and facilitate them to be outstanding professionals.
- To widen the ability to plan, analyze, design, code, test, implement & maintain a software product for real time systems.
- To support learners capability to set up their own enterprise in various sectors of Computer science
- To improve the knowledge of the learners in finding solutions and developing system based applications for real time problems in various domains involving technical, managerial, economical & social constraints.
- To develop in problem solving and programming skills in the various computing fields of IT industries.
- To prepare the learners to pursue higher studies in computing or related disciplines and to work in the fields of teaching and research like M.Phil., PhD etc.

(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 cash less transactions 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 System Engineer, Web Designers, and Software Developers

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

M.Sc. Computer Science Programme through Distance Learning mode is developed in order to give subject-specific skills including i) programming languages concepts ii) Operating systems, RDBMS, Data Structure and Software Engineering iii) inter-disciplinary knowledge like Mathematical foundation of computer science iv) Concepts like cloud computing, mobile computing v) Cutting Edge Technologies like Web Technology, .Net Frameworks.

(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 software trend, Industrial developments, research and feedback from stakeholders and learners.
2. Each student should secure 64 credits to complete M.Sc CS programme.
3. Each theory course carries 4 credits with 75 marks in the University end semester and 25 marks in the Internal Assessment and each practical (Lab) course carries 4 credits with 75 marks in the university end semester examination and 25 marks in the Internal Assessment.

Programme Code

M.Sc(Computer Science)	341
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Courses of Study M.Sc Computer Science

S.No	Course code	Title of the Course	CIA Marks	ESE Marks	Total Marks	Credits
I Semester						
1	34111	Design and Analysis of Algorithms	25	75	100	4
2	34112	Applied Mathematics for Computer Science	25	75	100	4
3	34113	Advanced Java Programming	25	75	100	4
4	34114	Lab – Advanced Java Programming	25	75	100	4
		Total	100	300	400	16
II Semester						
1	34121	Computer System Architecture	25	75	100	4
2	34122	Distributed Operating System	25	75	100	4
3	34123	.Net Programming	25	75	100	4
4	34124	Lab – .Net Programming	25	75	100	4
		Total	100	300	400	16
III Semester						
1	34131	Cryptography and Network Security	25	75	100	4
2	34132	Cloud Computing	25	75	100	4
3	34133	Web Technology	25	75	100	4
4	34134	Lab – Web Technology	25	75	100	4
		Total	100	300	400	16
IV Semester						
1	34141	Data Mining and ware housing	25	75	100	4
2	34142	Mobile Application Development	25	75	100	4
3	34143	Artificial Intelligence and Expert Systems	25	75	100	4
4	34144	Project	25	75	100	4
		Total	100	300	400	16
		Grand Total	400	1200	1600	64

CIA: Continuous Internal Assessment **ESE:** End semester Examination

Course Code	3	4	1	X	Y
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– Programme code for Master of Computer Science (M.Sc).

No. of Credits per course (Theory) : 4
 No. of Credits per course (Practical) : 4
 Total No. of credits per Semester : 16
 Total No. of credits of the Programme : 16 X 4 = 64

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 CS programme shall consist of a period of two years (Four Semesters).

e.4 Faculty and Support Staff Requirements:

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

S.No	Staff Category	Required Numbers
1	Computer Science Subject Core Faculty*	3
2	Inter-disciplinary Subject Faculty* (Mathematics)	1
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.

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 done by the Office of the Controller of Examinations, Alagappa University, Karaikudi

(f) Procedure for Admissions, curriculum transaction and evaluation

f.1 Minimum qualification for admission

Candidates for admission to the first year of the Master of Computer Science (M.Sc) programme shall be required to have passed the following examinations. Candidates who have passed any degree with Mathematics at +2 level 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 Courses with 4 credits each)	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 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 etc., for 25 marks.
- The learners should submit home assignment with worksheet for each course (Theory and Practical's) to **The Director, Directorate of Distance Education (DDE), Alagappa University, Karaikudi** Only along with response sheet contains name of the programme, name of the learner, enrolment number, course name and subject code.
- Learners should submit home assignments of each courses both theory and practicals at least one month before the commencement of end semester examination of every 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,	10

		PL/SQL coding , results	
TOTAL	25	TOTAL	25

End Semester Examination

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

Learners shall prepare practical record note book according to the following guidelines; aim, algorithm, source code, input, expected output and result of the experiment and submit during end semester practical examination.

f.3.1 Passing Minimum

- 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.

Answer ALL questions

One question from each unit from the course syllabi

Part – A (10 x 2 Marks: 20 Marks)

Part – B (5 x 5 Marks: 25 Marks) (Internal Choice)

Part – C (3 x 10 Marks: 30 Marks) (Internal Choice)

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 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, Karaikudi.**

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
90-100	9.0 - 10.00	O	Outstanding
80-89	8.0 - 8.9	D+	Excellent
75-79	7.5 - 7.9	D	Distinction

70-74	7.0 - 7.4	A+	Very Good
60-69	6.0 - 6.9	A	Good
50-59	5.0 - 5.9	B	Average
00-49	0.00	U	Reappear
ABSENT	0.00	AAA	Absent

For a semester

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

Grade Point Average = Sum of the multiplication of Grade points by the credit of the courses

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

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

$$\text{Sum of the credits of the courses for the entire programme}$$

Where

C_i - Credits earned for the course i in any semester

G_i - Grade Point earned for course i in any semester

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
9.5 – 10.00	O+	First class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	
6.5 and above but below 7.0	A+	First Class
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	
5.0 and above but below 5.5	B	Second Class
0.0 and above but 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	Nature of Fees
Admission Processing Fees	300	--	Non-Refundable
Course Fees	14,300	14,300	Non-Refundable
ICT fees	150	150	Non-Refundable
Total Fees	14,750	14,450	Non-Refundable

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 to 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 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.	Provisions for the fund
Programme development (Single time)	20,00,000/-	University's Own fund
Programme delivery (per year)	24,00,000/-	University's Own fund and fees to be collected from the learners
Programme maintenance (per year)	5,00,000/-	University's Own fund

(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

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
SEMESTER I

Course Code	Title of the Course
11	DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcome:

- Able to understand the various algorithmic problem solving methods.

Unit No.	Contents
	BLOCK 1: INTRODUCTION
1	Introduction: notion of algorithm, fundamentals of algorithmic problem solving, important problem types, fundamentals of analysis of algorithm efficiency
2	Asymptotic notations: Big-oh notation, omega notation, theta notation
3	Performance analysis: space complexity, time complexity, pseudo code for algorithms
	BLOCK 2 : MATHEMATICAL ANALYSIS OF NON RECURSIVE ALGORITHMS
4	Analysis of Recursive algorithms: algorithms for computing Fibonacci numbers
5	Empirical analysis of algorithms: Brute force, selection sort, Bubble sort, sequential sort
6	Closet-pair and convex-hull problems: Divide and conquer, merge sort, quick sort, Binary search, Strassen's matrix multiplication
	BLOCK 3 : DYNAMIC PROGRAMMING AND SEARCH BINARY TREES
7	General method: computing a Binomial coefficient, warshalls and Floyds algorithms, optimal search Binary trees, knapsack problems
8	Greedy Technique: General method
9	Applications : prims algorithm, kruskals algorithm, dijkstras algorithm
	BLOCK 4 : SORTING AND OPTIMIZATION PROBLEM
10	Sort and Searching algorithms: decrease and conquer, Insertion sort, Depth first search and Breadth first search, Topological sorting
11	Generating combinatorial objects: Transform and Conquer, presorting, Heap and Heap sort
12	Optimization Problems: Reductions, Reduction to Graph Problems
	BLOCK 5 : BACKTRACKING AND GRAPH TRAVERSALS
13	General method: 8 queens problem, sum of subsets, Graph colouring, Hamiltonian cycle, Branch and Bound, assignment problem, knapsack problem, travelling salesman pobles
14	Graph traversals: connected components, spanning trees, NP hard and NP complete problems

Course Code	Title of the Course
12	APPLIED MATHEMATICS FOR COMPUTER SCIENCE

Course objective

- To understand the basics of normal forms
- To understand the concept of graph theory

Course outcome

- Able to understand the graph theory
- Able to know transportation problem and solutions

Unit No.	Contents
	BLOCK 1: INTRODUCTION
1	Logic : TF statements, connectives, atomic and compound statements,
2	WFF, truth table of a formula,
3	Tautology, tautological implications and equivalence of formulae
	BLOCK 2 : NORMAL FORMS
4	Principal normal forms
5	Theory of inference, open statements, quantifiers, valid formulae and equivalence,
6	Theory of inference for predicate calculus
	BLOCK 3 : GRAPH THEORY
7	Basics concept of graph theory
8	Matrix representation of graphs
9	Trees : Definition, Spanning trees, Rooted trees, Binary trees
	BLOCK 4 : LINEAR PROGRAMMING PROBLEM
10	Mathematical foundations, graphical solutions
11	Slack of variables, simplex method, two phase method
	BLOCK 5 : TRANSPORTATION PROBLEM
12	Transportation table, solutions of transportation problem
13	Testing for optimality, assignment problem
14	The assignment method, special cases in assignment problems

Text Books:

1. Discrete Mathematics – Dr. M.K.Venkataraman, Dr N.Sridharan, N.Chandrasekaran- The National Publishing Company – Reprint 2003 (Unit I, II and III)
2. Operation Research – Kantiswarap, P.K.Gupta, Man Mohan- Sultan Chand & Sons – Reprint 2011.

Course Code	Title of the Course
13	ADVANCED JAVA PROGRAMMING

Course Objective

- To understand the advanced concepts in Java Programming
- To understand Internetworking using Java Programming

Course Outcome

- Able to write Programs using JDBC concept
- Able to write Servlet Programs

Unit No.	Contents
	BLOCK 1: INTRODUCTION
1	Introduction : JDBC overview, connection class, meta data function
2	SQL Exception, SQL warning
3	Statement, Result set, Other JDBC classes
	BLOCK 2 : INETADDRESS
4	InetAddress, TCP/IP client sockets, TCP/IP server sockets
5	URL, URL connection, Data grams
6	Client/Server applications using RMI
	BLOCK 3 : BDK AND DESIGN PATTERNS
7	Bean Development Kit, JAR files, Introspection
8	Design Patterns for properties, Events and methods
9	Constrained Properties, Persistence, Customizers
	BLOCK 4 : SERVLETS
10	Life cycle of servlet, Generic Servlet, HTTP servlet
11	Reading Initialization, Parameters, Reading Servlet Parameters
12	Cookies, Session Tracking
	BLOCK 5 : JAPPLET AND AWT CLASSES
13	JApplet, Buttons, Combo, Trees, Tables, Panes
14	AWT Classes, Working with Graphics, Color and Font

Text Books:

1. Patrick Naughton & Herbert Schildt, "The Complete Reference: Java 2", Tata
2. McGraw Hill, 1999. (Chapter - 18, 21, 24, 25, 26, 27)
3. Joseph Weber, "Using Java 2 Platform", Prentice Hall of India, 2000. (Chapter - 39, 40)

Books for Reference:

1. Deitel & Deitel, "Java How to Program", Prentice Hall, 5th Edition ,2002
2. Peter Hagggar, "Practical Java: Programming Language Guide", Addison-Wesley Pub Co, 1st Edition, 2000

Course Code	Title of the Course
14	LAB – ADVANCED JAVA PROGRAMMING

Course Objective:

- To understand to write applet programs
- To understand JDBC application programs

Course Outcome:

- Able to develop Client/Server application programs using RMI
- Develop chat server using Java

Unit No.	Contents
	BLOCK 1: INTRODUCTION
1	Simple Java program
2	Program using JDBC with create, insert table data
3	SQL Exception, SQL Warning
	BLOCK 2 : INETADDRESS
4	Programs using TCP/IP client sockets, TCP/IP server sockets
5	Program with URL, URL connection, Data grams connection
6	Client/Server applications using RMI
	BLOCK 3 : BDK AND DESIGN PATTERNS
7	Simple programs using Bean Development Kit, JAR files
8	Program with Design Patterns,
9	Program with Events and methods
	BLOCK 4 : SERVLETS
10	Create a servlet to read the parameters
11	Programs using cookies
12	Programs with session tracking
	BLOCK 5 : JAPPLET AND AWT CLASSES
13	Programs using JApplet, Buttons, Combo, Trees, Tables, Panes
14	Programs with AWT Classes, Working with Graphics, Color and Font

Reference Books

1. Joseph Weber, "Using Java 2 Platform" PHI ,2000

II Semester

Course Code	Title of the Course
341 21	COMPUTER SYSTEM ARCHITECTURE

Course Objective:

- To understand the computer system architecture, design
- To understand the Instruction Level Parallelism, memory optimizations

Course Outcome:

- Able to learn the computer design
- Able to learn the memory optimization, storage systems

Unit No.	Contents
	BLOCK 1: FUNDAMENTALS
1	Introduction : Definition, trends, power in IC, cost
2	Performance : Dependability, measuring, reporting and summarizing performance
3	Quality: Quality principles of computer design, performance
	BLOCK 2 : ILP CONCEPTS
4	Introduction: concepts and challenges, Basic computer techniques for exposing ILP, reducing branch costs with prediction, data hazards
5	Scheduling : dynamic scheduling, hardware based speculation, multiple issue and static scheduling, advanced techniques for instruction delivery and speculation
6	Limitations of ILP: hardware and software speculation, multithreading
	BLOCK 3 : THREAD LEVEL PARALLELISM
7	Multiprocessor and thread level parallelism: Introduction, symmetric shared memory architecture
8	Performance and architectures: performance of symmetric shared memory multiprocessors, Distributed shared memory architectures
9	Synchronization models: synchronization, model of memory consistency, cross cutting issues
	BLOCK 4 : MEMORY HIERARCHY DESIGN
10	Introduction : Optimization of cache performance, memory technology and optimizations
11	Protection: virtual memory and virtual machines
12	Issues : crosscutting issues in the design of memory hierarchies
	BLOCK 5 : STORAGE SYSTEMS
13	Introduction : advanced topics in Disk storage, real faults and failures, I/O performance, reliability measures and benchmarks
14	Issues : a little queuing theory, crosscutting issues, designing and evaluating and I/O system, the Internet Archive Cluster

Course Code	Title of the Course
341 22	DISTRIBUTED OPERATING SYSTEMS

Unit No.	Contents
	BLOCK 1: FUNDAMENTALS
1	Introduction : what is distributed operating system, Evolutions, models
2	Issues in designing distributed computing system
3	Introduction to computer networks: Network types, LAN, WAN, communication protocols, Internetworking, ATM technology
	BLOCK 2 : MESSAGE PASSING
4	Introduction: features, issued in PC message passing, synchronization
5	Buffering, multidatagram messages, Encoding and Decoding
6	Process addressing, failure handling, group communication
	BLOCK 3 : DISTRIBUTED SHARED MEMORY
7	Introduction: General architecture of DSM system, Design and implementation issues of DSM, Granularity, structure of shared memory consistency models, Replacement strategy, Thrasing
8	Other approaches to DSM, Heterogeneous DSM, advantages
9	Synchronization: Introduction, clock synchronization, Event ordering, mutual Exclusion, Deadlock, Election algorithm
	BLOCK 4 : DISTRIBUTED FILE SYSTEM
10	Introduction : Desirable features, file modes, file accessing models
11	File sharing semantics, file caching schemes, file replication
12	Fault Tolerance, atomic transaction, Design principles
	BLOCK 5 : SECURITY
13	Introduction : potential attacks to computer system, cryptography, authentication
14	Access control, Digital Signatures, Design Principles

Course Code	Title of the Course
341 23	.NET PROGRAMMING

Course Objective:

- To understand the .NET frameworks
- To understand the object oriented programming concepts in an .Net technology

Course Outcome:

- Able to learn visual basic .Net from basics to file handling
- Able to learn the ADO.Net and security models

Unit No.	Contents
	BLOCK 1: .NET FRAMEWORKS
1	Introduction: CLR, namespace, assemblies, class library
2	Basic Terminology: .Net component, .Net garbage collection
3	Oops concept: class, objects, structures, modules, abstraction, encapsulation, inheritance, polymorphism, overloading, overriding, shadowing
	BLOCK 2 : VISUAL BASIC.NET
4	Introduction: Data types, operators, arrays, dynamic arrays, String handling
5	Control statements: Conditional and looping statements, sub procedures and functions
6	Windows Forms: MDI form, events, msgbox, inputbox, Dialogboxes, passing forms, RichTextBoxes, Labels, Link labels
	BLOCK 3 : WINDOWS CONTROLS
7	Introduction: Buttons, checkbox, radio buttons, panel, list boxes, combo boxes, scrollbars, splitters, track bars, pickers, notify icons, timers, menus
8	Tree and list view: toolbars, status bars, progress bars, tab controls
9	Debugging and Error Handling: Types of errors, Exceptions and structured exception handling
	BLOCK 4 : ASP.NET
10	Introduction: file types, Importing namespaces, usage of Global.asax file, The page class, HttpRequest, HttpResponse, Server Utility
11	Basic web controls: List controls, validation and Rich controls, Data controls, custom controls
12	Overview of AJAX controls

BLOCK 5 : ADO.NET	
13	Introduction: Database access in the Internet world, characteristics, Data objects, Data namespace
14	SQL Basics: Data binding controls, Data set, Data table, Data row, data column, data list, data grid

Course Code	Title of the Course
341 24	LAB – .NET PROGRAMMING

Unit No.	Contents
BLOCK 1: .NET FRAMEWORK	
1	Programs using variables, constants and data types
2	Programs using arrays and dynamic arrays
3	Program using control flow statement
BLOCK 2 : VISUAL BASIC.NET	
4	Programs using functions and procedures, MDI forms, events
5	Programs using msgbox, inputbox, dialog boxes, working with multiple forms
6	Anchoring and docking controls, event handling, RichTextBoxes
BLOCK 3 : WINDOWS CONTROLS	
7	Programs using windows common controls
8	Programs using menus, built in dialog boxes, Image lis, tree and list views
9	Programs using toolbars, statusbars, progressbars, tab controls, graphics and file handling
BLOCK 4 : ASP.NET	
10	Writing ASP programs using HttpRequest and HttpResponse
11	Develop an application for ASP web controls, list controls, validation and rich controls, Data controls
12	Develop an application for HTML server controls, custom controls, logging and error handling
BLOCK 5 : ADO.NET	
13	Database applications using ADO.NET
14	Accessing a database using SQL commands, Data binding controls, DataList

Text Book:	

1. Visual Basic .Net programming, Steve Holzner, Dreamtech press.
2. The complete reference for ASP.Net, Mathew macdonald, TMH

Books for Reference:

1. Visual Basic .Net programming Bible, Bill Evjen, JasonBeres, Wiley dreamtech press.

III SEMESTER

Course Code	Title of the Course
341 31	CRYPTOGRAPHY AND NETWORK SECURITY

Course Objective:

- To understand the computer security concepts
- To understand the Data Encryption Standard mechanism

Course Outcome:

- Able to know AES, RSA cryptography principles
- Able to know Digital Signatures, E-mail security

Unit No.	Contents
BLOCK 1: COMPUTER SECURITY INTRODUCTION	
1	Introduction: The OSI security architecture, security attacks,
2	security services, security mechanisms, A model for network security
3	Classical Encryption Techniques: symmetric cipher model, substitution techniques
BLOCK 2 : BLOCK CIPHERS AND DES	
4	Block cipher principle, the data encryption standard, The strength of DES,
5	Differential and Linear cryptanalysis, Block cipher design principles
6	Advanced Encryption Standard: Finite Field arithmetic , AES structure, AES transformation function, Implementation
BLOCK 3 : PUBLIC KEY CRYPTOGRAPHY AND RSA	
7	Principles of public-key cryptosystems, The RSA algorithms
8	Other public key cryptosystems: Diffie-Helman key Exchange, Elgamel cryptographic system
9	Elliptic curve cryptography, pseudorandom number generation based on asymmetric cipher
BLOCK 4 : MESSAGE AUTHENTICATION CODES	
10	Message authentication requirements, functions, message authentication Codes
11	Security of MACs, MAC based Hash functions, MAC based ciphers
12	Digital Signatures: ElGamal Digital Signature scheme, schnorr digital

	signature schemes, digital signature standard
	BLOCK 5 : TRANSPORT LEVEL SECURITY
13	Web security considerations, Socket layer and transport layer and transport layer security
14	Electronic mail security: pretty good privacy, IP security overview, IP security policy, encapsulating security payload

Text Book:

1. William Stallings, "Cryptography and Network Security Principles and Practice", Pearson, 5th Edition.

Book for Reference:

1. William Stallings - "Data Communication" - Pearson

Course Code	Title of the Course
341 32	CLOUD COMPUTING

Course objective:

- To understand service oriented architecture and virtual storage applications

Course outcome:

- Able to know cloud computing Environments
- Able to know cloud virtualization technology

Unit No.	Contents
	BLOCK 1: CLOUD COMPUTING BASICS
1	Introduction: History, working with cloud computing, pros and cons of cloud computing, Benefits,
2	Developing cloud services, pros and cons of cloud service development, types of cloud service development
3	Discovering cloud services development services and tools
	BLOCK 2 : CLOUD COMPUTING FOR EVERYONE
4	Centralizing Email communications, collaborating to-do lists
5	Collaborating on household budgets, contact lists, communications across Community
6	Collaborating on schedules, collaborating on group project and events, cloud computing for corporation
	BLOCK 3 : CLOUD SERVICES
7	Exploring on-line calendar applications, Exploring online scheduling applications, Exploring online planning and task management
8	Collaborations with event management, contact management, project management, word processing and databases
9	Storing and sharing files and other online content
	BLOCK 4 : CLOUD COMPUTING ENVIRONMENT
10	Classification of cloud Implementation, Amazon web services, IaaS, VMware vCloud, Google AppEngine,PaaS, Windows Azure Platform, SaaS/PaaS, Microsoft Live

11	Comparison of cloud computing platforms
BLOCK 5 : CLOUD VIRTUALIZATION TECHNOLOGY	
12	Introduction : Virtualization Defined, Benefits, server virtualization
13	Hypervisor management software, Logical Partitioning, VIO Server, virtual Infrastructure requirements
14	Cloud virtualization: Introduction, storage virtualization, Storage area networks, cloud server virtualization, virtualized Data Centre

Text Book:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

Book for Reference:

1. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

Course Code	Title of the Course
341 33	WEB TECHNOLOGY

Objective:

- To understand the wide range of web technologies both client side and server side to provide exposure to the students in developing Rich Internet Applications.

Course Outcome:

- Able to know client side and server side programming

Unit No.	Contents
BLOCK 1: HTML,XHTML AND STYLE SHEETS	
1	Introduction: HTML, XML and WWW, Basic HTML, document Body, text, hyperlinks
2	Lists, using color and images, tables, multimedia objects
3	Style sheets: using styles, examples, formatting blocks of information
BLOCK 2 : CLIENT SIDE PROGRAMMING	
4	Introduction: Dynamic HTML, Java script, variables, string manipulations, mathematical functions, operators, arrays, functions
5	Regular expressions, cookies and Events
6	Dynamic HTML with Java script: Data validation, messages and confirmations, writing to a different frame, Rollover buttons, moving images
BLOCK 3 : HOST OBJECTS	
7	Browsers and DOM, DOM history and levels, Intrinsic event handling,
8	Representing web Data: XML, Documents and vocabularies, versions and declarations, namespaces
9	Java script and XML: Ajax, DOM based XML processing, SAX,XSL,XSLT,XPATH
BLOCK 4 : SERVER SIDE PROGRAMMING	
10	Java Servlets, history of web applications, The power of Servlets,

	HTTP servlet basics, the servlet API, page generations
11	The servlet Lifecycle: The servlet alternative, servlet reloading, Init and Destroy, single thread model, background processing, load on startup, client side caching, server side caching
12	Retrieving information: the servlet, the server, the client
BLOCK 5 : JSP TECHNOLOGY	
13	Introduction: Need, HTTP and servlet basics, HTTP request/response model, Servlets, anatomy of a JSP page, JSP application design with MVC
14	Setting up JSP Environment: Installing the JSDK, Installing Tomcat server, testing tomcat, creating, installing, running a JSP page

Text Books:

1. Web Programming: Building Internet applications, Chris Bates, Wiley India
2. Web technologies – A computer science perspective, Jeffrey C Jackson, Pearson Education,2006
3. Java server pages, Hans Bergsten, o'reilly,2010

Reference Books:

1. Robert W.Sebesta "Programming the world wide web" Pearson Education
2. Java servlet Programming, Joson Hunter, o'Reilly,2010
3. Bates, Developing web applications, wiley,2006.

Course Code	Title of the Course
341 34	LAB – WEB TECHNOLOGY

Course Objective:

- To understand the wide range of web technologies both client side and server side to provide exposure to the students in developing Rich Internet Applications.

Course Outcome:

- Able to develop client side and server side programming

Unit No.	Contents
	BLOCK 1: HTML,XHTML,STYLESHEETS
1	Programs using Basic HTML, text and hyperlinks
2	Programs using multimedia objects, XHTML
3	Programs using Style sheets
	BLOCK 2 : CLIENT SIDE PROGRAMS
4	Programs using JavaScript, Dynamic HTML, operators, arrays, cookies
5	Programs using Java script data validation, messages and confirmations
6	Programs using Rollover Buttons, writing to a Different frame, moving images
	BLOCK 3 : BROWSERS AND DOM
7	Programs using Intrinsic event handling, document tree
8	Representing web data, XML
9	Programs using Java script and XML, XSL, XSLT
	BLOCK 4 : SERVER SIDE PROGRAMS
10	Programs with simple Java Servlets
11	Programs with Init and Destroy, single thread model, client side caching and server side caching
12	Programs using Retrieving information from The Servlet-The Server-The Client
	BLOCK 5 : JSP PROGRAMS
13	Programs with simple JSP applications
14	Developing a program to access a database from a JSP page

Text Books:

1. Web Programming: Building Internet applications, Chris Bates, Wiley India
2. Web technologies – A computer science perspective, Jeffrey C Jackson, Pearson Education,2006
3. Java server pages, Hans Bergsten, o'reilly,2010

Reference Books:

1. Robert W.Sebesta “Programming the world wide web” Pearson Education
2. Java servlet Programming, Joson Hunter, o'Reilly,2010
3. Bates, Developing web applications, wiley,2006.

IV SEMESTER

Course Code	Title of the Course
41	DATA MINING AND WAREHOUSING

Course objective:

- To learn design of data store of warehousing, Retrieving and mining information of warehouse

Course outcome:

- Able to know data mining techniques and trends
- Able to know associative rules, clustering techniques and web mining.

Unit No.	Contents
BLOCK 1: DATA WAREHOUSING	
1	Introduction: definition, architecture, warehouse schema, warehouse server, OLAP operations
2	Data warehouse technology: Hardware and operating system, warehousing software, Extraction tools, Transformation tools
3	Case studies: data warehousing in Government, tourism, Industry, Genomics data
BLOCK 2 : DATA MINING	
4	Introduction: definition, techniques, current trends in data mining
5	Different forms of knowledge: Data selection, cleaning, Integration, Transformation, Reduction and Enrichment
6	Data : types of data, data quality, data preprocessing, measures of similarity and dissimilarity, Exploration, summary statistics, visualization
BLOCK 3 : ASSOCIATION RULES	
7	Introduction: methods to discover association rule, apriori algorithm partition algorithm, pincher search algorithm
8	Dynamic Item set algorithm, FP Tree growth algorithm
9	Classification: Decision tree classification, bayesian classification, classification by Back propagation
BLOCK 4 : CLUSTERING TECHNIQUES	
10	Introduction: clustering paradigms, partitioning algorithms, K means & K mediod algorithms, CLARA, CLARANS, Hierarchial clustering, DBSCAN, BIRCH, clustering algorithms, STIRR, ROCK, CACTUS
11	Machine Learning: supervised learning, unsupervised learning, machine learning and data mining
12	Neural networks: Introduction, use of NN, working of NN Genetic algorithm
BLOCK 5 : WEB MINING	
13	Introduction : web content mining, web structure mining, web usage mining, text mining, Text clustering, Temporal, spatial, visual data mining, knowledge mining
14	Tools and techniques: using weka, Rapidminer and matlab

Text Book:

1. Arun K Pujari, Data mining Techniques, University press, 2008
2. CSR Prabhu, Data warehousing-concepts, techniques and applications, Prentice Hall of India.

Book for Reference:

1. Jaiwan han, Michelinne Kamar, Data Mining: Concepts and Techniques, Harcourt India/Morgan Kauffman Publishers ,2008
2. Alex Berson, Stephen J Smith, Data warehousing, data mining&OLAP, TMH, 2004.

Course Code	Title of the Course
42	MOBILE APPLICATION DEVELOPMENT

Course objective:

- To provide an overall knowledge about mobile devices, communication methodologies and its application development

Course outcome:

- Able to know mobile ecosystem, mobile information architecture
- Able to know J2ME architecture and development and case studies

Unit No.	Contents
	BLOCK 1: MOBILE ECOSYSTEM
1	Introduction: The mobile ecosystem, operators, networks
2	Devices : platforms, operating systems
3	Applications : application frameworks, applications, services
	BLOCK 2 : MOBILE DEVICE PROFILES
4	Categories : SMS, mobile websites, mobile web widgets
5	Native applications: Games, utility apps, location based services(LBS)
6	Apps : Informative apps, Enterprise apps
	BLOCK 3 : MOBILE INFORMATION ARCHITECTURE
7	Introduction : sitemaps, click streams, wireframes, prototyping, architecture
8	Mobile design : Interpreting design, Elements of mobile design
9	Mobile design tools : Designing for different device/ screens
	BLOCK 4 : J2ME
10	Introduction : J2ME architecture and development environment, small computing device requirements, Run-time environment, MIDlet programming
11	Languages : J2ME, J2ME SDK, J2ME wireless toolkit
	BLOCK 5 : CASE STUDY
12	Introduction : Google Android introduction, Android development Environment
13	Development framework, SDK, Eclipse, Emulator, Android AVD
14	Project framework: Apple IOS, RIM Blackberry, Samsung Bada, Nokia Symbian, Microsoft windows phone

Text Book:

1. Brian Fling, Mobile Design and Development, OReilly media,2009.
2. James Keogh, J2ME, The Complete Reference, TataMcHill,2003

Book for Reference:

1. Pei zheng and Lionel Ni, Smart phone and Next Generation Mobile Computing, Elsevier, 2006
2. Mark L.Murphy, Beginning Android”, Apress 2009.

Course Code	Title of the Course
43	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

Course objective:

- To familiarize the basic concepts in artificial intelligence
- To understand the basic concepts in expert systems

Course outcome:

- Apply forward and backward reasoning algorithms, searching algorithms and optimization algorithms to create problem solving agents.
- Represent knowledge using propositional logic, inference rules and Bayesian networks.
- Design simple expert systems.
- Design algorithms for robotics and machine vision.

Unit No.	Contents
BLOCK 1: PROBLEMS AND SEARCH	
1	Introduction: Concept of AI, approaches –Application areas Problem formulation- -Forward & Backward reasoning-Graphs & Trees
2	Measuring Problem solving agents: problem solving performance
3	Search Strategies-local search algorithms and optimization problems, Genetic Algorithms, terminology.
BLOCK 2 : KNOWLEDGE REPRESENTATION	
4	Relational knowledge & Procedural knowledge Propositional Logic – Syntax & semantics –Inference rules –Inference methods
5	Knowledge engineering process –Handling uncertain knowledge
6	Bayesian networks –Learning –Pattern recognition.
BLOCK 3 : KNOWLEDGE BASED SYSTEMS	
7	Expert systems–Components, Characteristic features of expert systems
8	Rule based system architecture-Using domain knowledge
9	Expert system shell -Explaining the reasoning and knowledge acquisition- Applications
BLOCK 4 : AI IN ROBOTICS	
10	State space search -Block word & robot example -Path selection -Monkey & Banana problem AND –OR graph -Means end analysis in a robotic problem - Robot problem solving as a production system -Triangle table-Robot learning
11	Robot task planning -Phases in task planning -Symbolic spatial relationships - Obstacle avoidance -Graph planning.
BLOCK 5 : MACHINE VISION	
12	Introduction –Functions in a vision system –Imaging devices –Lighting–A-D conversion–Quantization–Encoding image storage–Image data reduction
13	Segmentation techniques –Feature extraction –object recognition
14	Training the vision system –Robotic applications of machine vision

Text books

1. Stuart Russel, Peter Norvig, “Artificial Intelligence: A Modern Approach-2/e”, 2003, Pearson Education.
2. Elaine Rich, Kevin Knight, “Artificial Intelligence” 2/e, 1991, TMH.

References

1. Dan W. Patterson, “Introduction to Artificial Intelligence & Expert Systems”, Seventh Indian Reprint 1999, EEE, PHI.

Course Code	Title of the Course
44	PROJECT

1. The students will be allowed to work an any project based on the concepts studied in core courses
2. The following list of parameters taken into account for the evaluation of project work. Total marks: 100 (Internal : 25 marks, External:75 marks)

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

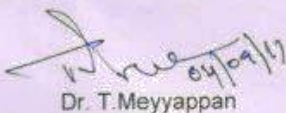
After the deliberation and discussion the board resolved the following:

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

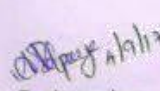

Dr. E. Ramaraj

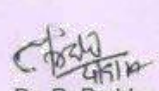

Dr. K. Kuppusamy

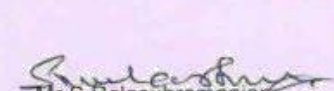

Dr. T. Meyyappan


Dr. S. S. Dhenakaran


Dr. K. Mahesh


Dr. A. Padmapriya


Dr. P. Prabhu


Mr. S. Balasubramanian

