

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN

[AUTONOMOUS]

M.Sc., (INFORMATION TECHNOLOGY)

For candidates admitted form 2014-2015 onwards

REGULATIONS

I. SCOPE OF THE PROGRAMME

Master of Science in Information Technology [M.Sc IT] can be considered to be one of the most prominent Master's level programs in our country. This program mainly deals with the development of computer applications for the purpose of updating computer programming languages. M.Sc. [IT] also aims at creating strong knowledge of theoretical Information Technology subjects who can be employed in research and development units of industries. The course has a time period of 2 years with 4 semesters.

II. SALIENT FEATURES

- Regular conduct of guest lectures and seminars
- Campus recruitment
- Provides facilities such as Internet Access and In-House Library
- Provides Career Guidance for Higher studies.
- Conduct of Personality Development Program
- Visiting Faculties from Industries

III. OBJECTIVES OF THE COURSE

The Course Objective of the M.Sc. Information Technology program is to provide advanced and in-depth knowledge of Information Technology and its applications to enable students pursue a professional career in Information and Communication Technology in related industry, business and research. The course designed to impact professional knowledge and practical skills to the students.

IV. ELIGIBILITY FOR ADMISSION

A Candidate who has passed B.Sc. Computer Science / BCA/ B.SC. Computer Technology / B.Sc. Information Science / B.Sc. Information Technology / B.Sc. Software Engineering Degree of Periyar university or any of the Degree of any other university accepted by the syndicate as equivalent thereto subject to such conditions as may be prescribed therefore shall be permitted to appear and qualified for the M.Sc. Information Technology Degree Examinations of Vivekanandha College of Arts and Sciences for Women after a course of study of two academic years.

V.DURATION OF THE PROGRAMME

- The course shall extend over a period of two academic years consisting of four semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to April.

- The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University.

VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously and the Internal

Assessment Marks will be as under:

- | | |
|-------------------------|------------|
| 1. Average of two Tests | - 10 Marks |
| 2. Seminar | - 05 Marks |
| 3. Assignment | - 05 Marks |
| 4. Attendance | - 05 Marks |

Total	= 25 Marks
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Internal Assessment Marks for Practical

- | | |
|----------------|------------|
| 1. Attendance | - 10 Marks |
| 2. Observation | - 10 Marks |
| 3. Test | - 20 Marks |

Total	= 40 Marks
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PASSING MINIMUM (Theory)

EXTERNAL

In the End Semester Examinations, the passing minimum shall be 50 % out of 75 Marks. (38 Marks)

PASSING MINIMUM (Practical)

EXTERNAL

In the University Examinations, the passing minimum shall be 50 % out of 60 Marks. (30 Marks)

Distribution of Marks

Record	: 05 Marks
Program writing	: 10 Marks
Debugging	: 10 Marks
For Correct Results	: 05 Marks

The Passing minimum shall be 50% out of 60 marks (30 Marks)

INTERNAL

The Passing minimum shall be 13 out of 25 marks

VII. ELIGIBILITY FOR EXAMINATION

PERCENTAGE	MARKS	
	THEORY	PRACTICAL
75-80	1	2
81-85	2	4
86-90	3	6
91-95	4	8
96-100	5	10

A candidate will be permitted to appear for the University Examination only on earning 75 % of attendance and only when her conduct has been satisfactory. It shall be opened to grant exemption to a candidate for valid reasons subject to conditions prescribed.

VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (main and allied subjects) and securing marks

- 75 % and above shall be declared to have passed the examination in first class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.
- 60% and above but below 75 % shall be declared to have passed the examinations in first class without Distinction.
- 50%and above but below 60% shall be declared to have passed the examinations in second class.
- Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of two consecutive academic years from the year of admission only will be eligible for University rank.

IX. ELIGIBILITY FOR AWARD OF THE DEGREE

A candidate shall be eligible for the award of the degree only if she has undergone the above degree for a period of not less than two academic years comprising of four semesters and passed the examinations prescribed and fulfilled such conditions have been prescribed therefore.

X. PROCEDURE IN THE EVENT OF FAILURE

If a candidate fails in a particular subject, she may reappear for the semester examination in the concerned subject in subsequent semesters and shall pass the examination.

XI. COMMENCEMENT OF THE REGULATIONS

The regulations shall take effect from the academic year 2014-15 (i.e.) for the students who are to be admitted to the first year of the course during the academic year 2014-15 and thereafter.

Candidates who were admitted to the PG course of study before 2014-2015 shall be permitted to appear for the examinations under those regulations for a period of two years i.e., up to and inclusive of the examination of 2016-2017. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

EVALUATION OF EXTERNAL EXAMINATIONS (EE)

QUESTION PAPER PATTERN – Theory

Time duration: 3 Hours

Max. Marks: 75

PART- A: 5x5= 25

Answer all the questions

One Question from each unit (either or type)

PART- B: 5x10 = 50

Answer all the questions

One Question from each unit (either or type)

The Passing minimum shall be 50% out of 75 marks (38 marks)

QUESTION PAPER PATTERN – Practical

Time duration: 3 Hours

Max. Marks: 60

1. One compulsory question from the given list of objectives : 30 Marks
2. One either/OR type question from the given list of objectives : 30 Marks

The Passing minimum shall be 50% out of 60 marks (30 marks)

Distribution of Marks

Problem Understanding	: 05 Marks
Program writing	: 10 Marks
Debugging	: 10 Marks
For Correct Results	: 05 Marks

EVALUATION PATTERN – Project Dissertation

Evaluation (External)	: 40 Marks
Viva-voce (Internal, External)	: 20 Marks

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN
[AUTONOMOUS]
ELAYAMPALAYAM, TIRUCHENGODE -637 205.
DEPARTMENT OF COMPUTER SCIENCE
M.Sc. – INFORMATION TECHNOLOGY
COURSE PATTERN AND SCHEME OF EXAMINATIONS UNDER CBCS
for the Candidates admitted from the year 2014-2015

Sem	Course Code	Courses	Credits	Hours	Marks		
					I.A. Marks	E.E. Marks	Total Marks
I	14P1IT01	Core Course-I - Advanced Computer Architecture	4	5	25	75	100
	14P1IT02	Core Course-II -Design and Analysis of Algorithms	4	5	25	75	100
	14P1IT03	Core Course-III - Advanced Java Programming	4	5	25	75	100
	14P1IT04	Core Course-IV- Wireless Application Protocol	4	5	25	75	100
	14P1ITE__	Elective Course- I	4	5	25	75	100
	14P1ITP01	Core Course-V- Advanced Java Programming Lab	2	5	40	60	100
	TOTAL			22	30	165	435
II	14P2IT05	Core Course-VI – Multimedia and Virtual reality	4	4	25	75	100
	14P2IT06	Core Course-VII - .Net Programming	4	4	25	75	100
	14P2IT07	Core Course-VIII – Advanced Database Management Systems	4	5	25	75	100
	14P2IT08	Core Course-IX – Data Mining and Warehousing	4	5	25	75	100
	14P2ITE__	Elective Course -II	4	4	25	75	100
	14P2ITP02	Core Course-X - Multimedia Lab	2	4	40	60	100
	14P2ITP03	Core Course-XI - Programming in .Net Lab	2	4	40	60	100
	TOTAL			24	30	205	495
III	16P3IT09	Core Course-XII – Open Source Technologies	4	5	25	75	100
	14P3IT10	Core Course-XIII - High Performance Computing	4	5	25	75	100
	14P3IT11	Core Course-XIV – Cyber Crime and Security	4	5	25	75	100
	14P3ITE__	Elective Course- III	4	5	25	75	100
		EDC- I	2	4	25	75	100
	14P3ITP04	Core Course-XV- Open Source Technologies Lab	2	4	40	60	100
	14P3ITPR01	Core Course-XVI – Mini Project	2	2	40	60	100
		Human Rights	1	-	25	75	100
TOTAL			23	30	230	570	800
IV	14P4IT12	Core Course-XVII –Soft Computing Techniques	4	5	25	75	100
	14P4IT13	Core Course-XVIII – Distributed Computing	4	5	25	75	100
	14P4ITE__	Elective Course -IV	4	5	25	75	100
	14P4ITP05	Core Course –XIX-Web Technologies Lab	2	4	40	60	100
	14P4ITPR02	Core Course-XX - Dissertation and Viva-Voce (In-house Project)	8	-	40	60	100
	TOTAL			22	19	155	345
Total No. of credits (Core + EDC+Elective)			72+2+1+16=91	109	755	1845	2600

EDC-EXTRA DISCIPLINARY COURSE

Students are expected to opt EDC (Non major elective) offered by other departments.

I.A. – INTERNAL ASSESSMENT

E.E. – END SEMESTER EXAMINATIONS

The content of the syllabus and regulations may be followed for first and second semesters as per the regulations passed in the academic year 2012-2013.

ELECTIVE COURSES

Elective-I

Course Code	Course Name
14P1ITE01	Network Security
14P1ITE02	Software Project Management and Quality Assurance
14P1ITE03	Advanced Networks

Elective-II

Course Code	Course Name
14P2ITE04	Embedded Systems
14P2ITE05	Object Oriented Analysis and Design
14P2ITE06	Artificial Intelligence & Expert Systems

Elective-III

Course Code	Course Name
14P3ITE07	Mobile Computing
14P3ITE08	Mobile & Pervasive Computing
14P3ITE09	Linux Programming

Elective-IV

Course Code	Course Name
14P4ITE10	Cloud Computing & Security
14P4ITE11	Digital Image Processing
14P4ITE12	Enterprise Resource planning

2014-2015 Onwards	ADVANCED COMPUTER ARCHITECTURE (14P1IT01)	M.Sc. Information Technology
I Semester		Core: Theory
Hours: 50		Credit : 4

Objective:

To provide in-depth coverage of current and emerging trends in computer architectures, focusing on performance and the hardware/software interface.

UNIT I

Hours: 07

Introduction: Structure and Function-**Computer Evaluation and Performance:** History of computers- *Designing for Performance:* Microprocessor speed-performance balance-Improvement in chip organization and architecture.

Computer Function and Interconnection: Computer Components-*Computer Function:* Instruction Fetch and Execute- I/O Function. Interconnection structure-*Bus interconnection:* Bus structure-Multiple bus hierarchies-Elements of Bus design. *PCI:* PCI Bus Structure- PCI Commands-Data transfers-Arbitration.

UNIT II

Hours: 13

Cache Memory: Characteristics of Memory Systems-Memory hierarchy-Cache memory principles- *Elements of cache design:* Cache size-Mapping function-replacement algorithms-write policy-line size-Number of caches.

Internal Memory: *Semi-conductor main memory:* Organization-DRAM & SRAM-types of ROM- Chip Logic- Chip Packaging-Module Organization.

External Memory: *Magnetic Design:* read and write mechanism-Data organization and Formatting-physical characteristics-Disk performance parameters. *Optical memory:* Compact Disk- DVD. Magnetic tape.

UNIT III

Hours: 10

Computer Arithmetic: ALU-*Integer Representation:* Sign magnitude representation-Two's complement Representation-Fixed point Representation. *Integer Arithmetic:* Negation-Addition & Subtraction-Multiplication-Division. Principles of Floating point Representation.

Instruction Sets: Characteristics & Functions: Machine Instruction characteristics-Types of Operands-Types of Operations.

Instruction Sets: Addressing Modes and Formats: *Addressing:* Immediate- Direct-Indirect- Register- Register Indirect- Displacement addressing- Stack addressing. *Instruction Formats:* Instruction Length- Allocation of Bits- Variable length instructions.

UNIT IV

Hours: 08

Processor structure & Function: Processor Organization- Register organization-Instruction cycle-instruction pipelining-The Pentium Processor.

Control Unit Operations: *Micro Operations:* The fetch cycle- The Indirect Cycle-The Interrupt cycle- The Execute Cycle- The instruction Cycle. *Control of the Processor:* Functional Requirements-Control Signals-A control signals example- Internal Processor Organization-The Intel 8085. *Hardwired Implementation:* Control Unit Inputs-Control Unit Logic.

UNIT V

Hours: 12

Parallel Processing: *Multiple Processor Organizations:* Types of parallel processor Systems- Parallel Organizations. *Symmetric Multiprocessors:* Organization-Multiprocessor Operating System Design considerations- A mainframe SMP. *Cache Coherence and the MESI Protocol:* Software Solutions-Hardware Solutions-Snoopy Protocols-The MESI Protocol-

Read Miss-Read Hit-Write Miss-Write Hit-Cache Consistency. Multithreading and chip multiprocessors- Clusters-Approaches to vector Computation.

TEXT BOOK

1. Computer Organization & Architecture-Designing for Performance by William Stallings, Ninth Edition, 2012, PEARSON Prentice Hall Publication.

REFERENCE BOOKS

1. Computer Systems Organizations & Architecture by John D. Carpinelli, First Edition, 2007, PEARSON Prentice Hall Publication.
2. Computer System Architecture by M. Morris Mano, Third Edition, 2006, PEARSON Prentice Hall Publication.
3. Computer Architecture: Concepts and Evaluation by Gerrit A. Blaauw, First Edition, 2008, PEARSON Prentice Hall Publication.
4. Computer System Architecture and Parallel Processing by Kai Hwang, Faye A. Briggs, 2009, McGraw-Hill Publications.

2014-2015 Onwards	DESIGN AND ANALYSIS OF ALGORITHMS (14P1IT02)	M.Sc.
I Semester		Information Technology
Hours: 50		Core: Theory
		Credit : 4

Objectives:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

UNIT -I

Hours: 10

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notations - and Mathematical Analysis of Recursive and Non-Recursive Algorithms.

UNIT-II

Hours: 11

Divide and conquer methodology – Merge Sort – Quick Sort – Binary search – Binary Tree Traversal – Multiplication of large integers- Strassen’s matrix multiplication Greedy method – Prim’s algorithm – Kruskal’s algorithm – Dijkstra’s Algorithm.

UNIT-III

Hours: 10

Transform and Conquer – Presorting - Balanced Search Tree – AVL Tree - Heaps and Heap Sort - Dynamic Programming - Computing a binomial coefficient – Warshall’s and Floyd’s algorithm.

UNIT-IV

Hours: 10

Optimal binary - search tree – Knapsack problem – Backtracking – N-Queens problem – Hamiltonian circuit problem – subset sum problem.

UNIT-V

Hours: 09

Branch and bound: Assignment problem – Knapsack problem – Traveling salesman problem. – Approximation algorithms for NP-hard NP Complete Problems.

TEXT BOOK

1. Anany Levitin, “Introduction to the Design and Analysis of Algorithm”, Pearson Education Asia, 2006.(Unit -I: chapter 1,2 Unit -II : chapter 4,9 Unit III: chapter 6,8 Unit -IV: chapter 8,11 Unit -V: chapter 11)

REFERENCE BOOKS

1. T.H.Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, “Introduction to Algorithms”, PHI Pvt. Ltd., 2001.
2. Sara Baase and Allen Van Gelder, “Computer Algorithms – Introduction to Design and Analysis”, Pearson Education Asia, 2003.
3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, “The Design and Analysis of Computer Algorithms”, Pearson Education Asia, 2003.

2014-2015 Onwards	ADVANCED JAVA PROGRAMMING (14P1IT03)	M.Sc. Information Technology
I Semester		Core: Theory
Hours: 50		Credit : 4

Objectives

To learn the fundamentals of Java and focus on developing high quality, working software that solves real problems.

Unit – I

Hours: 08

AWT: Using AWT Controls, Layout Managers and Menus. SWING: A Tour of SWING – Event Handling - Java Database Connectivity (JDBC).

Unit – II

Hours: 09

Java Servlets: Life cycle of Servlet - constituents of javax.servlet.package- Constituents of javax.servlet.http.package-Cookies- Session Tracking. Java Server Pages: Introducing Java Server Pages-Basic Elements–Actions Elements-Implicit Objects.

Unit – III

Hours: 11

Remote method Invocation: Remote Interface-java.rmi.server package-The Naming Class - RMI Security Manager Class -RMI Exceptions - Steps involved in creating RMI Client and Server Classes. Java Bean: Advantages of Java Bean –Application Builder Tools- JAR files-Introspection - Developing a Simple Java Bean using JDK- Persistence – Customizers - Java Mail.

Unit – IV

Hours: 10

Understanding EJB: EJB Architecture-Session Bean-Developing Session Beans-Entity Beans - Bean managed persistence in Entity Beans. Understanding Struts: Introduction-MVC Framework- Struts Control flow - Building Model Components - Building View Components – Building Control Components.

Unit – V

Hours: 12

Hibernate: Features of Hibernate-Hibernate Architecture – Understanding Hibernate O/R Mapping - Hibernate Query Language. Spring: Introduction to the Spring Framework - Features of the Spring-Spring Architecture-Spring AOP-Testing-Data Access using JDBC.

TEXT BOOKS

- 1) Herbert Schildt, "The complete Reference-Java 2", fifth Edition 2002 TMH
(Unit-I : Chapters 20, 22 & 26, Unit –III: Chapter 25)
- 2) Java server programming (J2ee 1.4)-2007 platinum Edition. Kogent solution Inc.
(Unit-IV : Chapters 9& 18, Unit-V : Chapters 20& 21)

- 3) Dr C.Muthu “programming with Java”, Vijay Nicole Imprints Private Ltd 2008
(Unit-I :Chapter 18, Unit-II :Chapter 19, Unit-III : Chapter 20)
- 4) Java server pages in easy steps –Mike Mcgrath-2002-dreamtech-New Delhi.
(Unit-II : Chapters 1, 2, 3&5)

REFERENCE BOOKS

- 1) Enterprise JavaBeans-Developing component based distributed Applications-Pearson Education,2004
- 2) Deitel H.M. & Deitel P.J,”Java How to Program”,Prentice-Hall of India, fifth edition , 2003
- 3) Cay.S Horstmann,Gray Cornel,”Core Java 2 – Vol.II- Advanced features”,Pearson Education, 2004.

2014-2015 Onwards	WIRELESS APPLICATION PROTOCOL (14PIIT04)	M.Sc. Information Technology
I Semester		Core: Theory
Hours: 50		Credit : 4

Objectives

- Be able to discuss current and emerging technology in Wireless technology.
- Understand fundamental trends of technological evolution of Wireless technology.
- Acquire creative skills in design, layout, and interactivity of WAP pages.

UNIT-I

Hours: 13

Introduction – Key Services for the Mobile Internet – Business Opportunities. Making the Internet “Mobile”: Challenges and Pitfalls – The Origins of WAP – WAP Architecture – Components of the WAP Standard – Network Infrastructure services Supporting WAP Clients.

UNIT-II

Hours: 12

The Wireless Markup Language: Overview – The WML Document Model – WML Authoring – URLs Identify Content – Markup Basics – WML Basics – Basic Content – Events, Tasks and Bindings – Variables – Other Contents – Controls – Miscellaneous Markup – Sending Information – Application Security – Document Type Declaration – Errors and Browser Limitations.

UNIT – III

Hours: 08

User Interface Design: Making wireless Application easy to use: Web Site Design: Computer Terminals versus Mobile Terminals – Designing a usable WAP Site – Structured Usability Methods – User Interface Design Guidelines – Application of WAP

UNIT-IV

Hours: 09

Tailoring Content to the Client-Push Messaging: Overview of WAP Push – Push Access Protocol – WAP Push Addressing – Push Message – MIME media types for Push Messages – Push Proxy Gateway – Push Over – the – Air Protocol – Push Initiator Authentication and Trusted Content.

UNIT-V

Hours: 12

Wireless Telephony Applications: Overview of the WTA Architecture – The WTA Client Framework – The WTA Server and Security – Design Considerations – Application Creation Tool Box – Future WTA Enhancements – Mapping the Deployment Chain to the Business value chain – Security Domains – Linking WAP and the Internet – WAP Service Design – The Mobile Internet Future.

TEXT BOOKS

1. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Daniel Mauney, Jari Alvinen, David Bevis, Jim Chan., “The Wireless Application Protocol – Writing Application for the mobile internet”, Pearson Education, 2010.

(UNIT-I :Chapter - 1 to 6, UNIT-II :Chapter - 7, UNIT-III :Chapter - 10, UNIT-IV: Chapter - 11&12, UNIT-V :Chapter - 13 to 15).

REFERENCE BOOKS

- 1 .Charless Arehare, Nirmal Chidambaram, and others, “Professional WAP”, Wrox Press Ltd., Shroff publ. And Dist – Pvt. Ltd., 2001.

2014-2015 Onwards	ADVANCED JAVA PROGRAMMING LAB (14P1ITP01)	M.Sc. Information Technology
I Semester		Core: Practical
Hours: 50		Credit : 2

1. To Develop Student Information using AWT.
2. To Prepare Electricity Bill Using Swing.
3. To implement Library information using JDBC.
4. To maintain Employee information using servlets.
5. To implement session and cookies concepts using servlets
6. To develop Online Job Registration using JSP.
7. Create a simple application using JSP and Java Beans
8. To develop Arithmetic Operation Using RMI.
9. To create Simple Session Bean.
10. To Implement Banking Operations using Entity Bean.
11. To develop Simple Web Application using Struts.
12. To implement Simple Hibernate program.

2014-2015 Onwards	MULTIMEDIA AND VIRTUAL REALITY (14P2IT05)	M.Sc. Information Technology
II Semester		Core: Theory
Hours: 50		Credit : 4

Objectives

- To formulate a working definition of interactive multimedia
- To demonstrate the use of animation, digitized sound, video control, and scanned images
- To develop conceptual maps of content and process for interactive multimedia instructional programs

UNIT I

Hours: 08

Introduction – Branch Overlapping Aspects of Multimedia Content – Global Structure –Multimedia Literature . Multimedia – Media and Data Streams – Medium .

UNIT II

Hours: 10

Sound/Audio : Basic Sound Concepts – Music –Speech , Images and Graphics : Basic Concepts – Computer Image Processing – Video and Animation : Basic Concepts – Television – Computer Based Animation.

UNIT III

Hours: 09

Data Compression : Storage Space – Coding Requirements – JPEG – MPEG – DVI, Optical Storage Media , Computer Technology – Multimedia Operating System.

UNIT IV

Hours: 08

Networking System : Layers , Protocols and Services , Networks , Metropolitan Area Networks , WAN , Multimedia Communication System.

UNIT V

Hours: 15

User Interfaces, Synchronization , Abstraction for Programming : Abstraction Levels – Libraries – System Software – Toolkit – Higher Programming Languages . Multimedia Application : Introduction – Media Population – Media Composition – Media Communication – Trends.

TEXT BOOK

1. Ralf Steinmetz & Klara Nahrstedt – “ Multimedia Computing , Communication & Applications “ Pearson Education.

REFERENCE BOOKS

1. Fred T,Hofstetter – “ Multimedia Literacy “ – 3rd edition TMH.
2. Simoin j.,Gibbs, Dionysios C and Tsihriziz “ Multimedia Programming” , Addison Wesley, 1994
3. John F.Koegel Buford, “ Mutimedia Systems”, Addison Wesley, 1994.

2014-2015 Onwards	.NET PROGRAMMING (14P2IT06)	M.Sc. Information Technology
II Semester		Core: Theory
Hours: 50		Credit : 4

Objectives

- Acquire a working knowledge of creating and rich internet Web application using the .NET Framework and Visual Studio.
- Learn how to implement web applications using web forms, including programs that interact with databases.

Unit – I

Hours: 08

Introduction the .NET Framework: .NET Framework – C#, VB.NET and the .NET Languages – CLR- .NET Class library. Learning the C# languages: C# language Basics- Variables- Data types – Variable Operations -Object based Manipulation - Conditional & Looping Structures- Methods, Types, Objects and Namespaces.

Unit – II

Hours: 09

Web Form Fundamentals: HTML Control classes - Page class – Web Controls: Web Control classes- List classes – Table controls – AutoPostBack and Web control events. Tracing, Logging and Error Handling: Exception Handling – Handling Exceptions -Throwing your own exception - Logging exceptions - Error Pages - Page Tracing.

Unit – III

Hours: 10

Validation and Rich Controls: Validation – Examples – Understanding Regular Expression – Rich Controls – State Management: View state - Custom cookies - Session state – Application state. ADO.NET Fundamentals: ADO.NET and Data Management – SQL Basics – ADO.NET Basics.

Unit – IV

Hours: 12

ADO.NET: Direct Data Access – Creating a Connection – Defining a Select command – Updating data –Disconnected data access. Data binding: Introducing Data Binding - Single Value Data Binding – Repeated value Data Binding - Data Source Controls. The Data Controls: The Grid View –The Details View-The Form View.

Unit – V

Hours: 11

XML: XML'S hidden role in .NET-.XML Explained – XML Classes – XML validation-XML display & transforms XML Data Binding – XML in ADO.NET. Getting Started with ASP.NET Ajax - Understanding the ASP.NET Ajax Architecture - Working with the XMLHttpRequest Object – JSON.

TEXT BOOKS

1. Beginning ASP.NET 2.0 in C# 2005: From Novice to Professional (Beginning: From Novice to Professional). Matthew MacDonald (Author) publication: APress 2005.
(Unit –I: Chapter 1,2&3 Unit-II :Chapter 5,6&7 Unit-III :Chapter 8,9&13 Unit-IV :Chapter 13,14&15 Unit-V :Chapter 17)
2. Joydip Kanjilal and Sriram Putrevu, “Sams Teach Yourself ASP.NET Ajax in 24 Hours”, SAMS, 2008. (Unit-V :Chapter 1,2,3&5)

REFERENCE BOOKS

1. Dave Mercer, “ASP. NET A Beginner’s Guide”, Tata McGraw –Hill Pub. Company Ltd, 2002
2. Matt J. Couch, “ASP. NET and VB. NET Web programming “, Pearson Education, 2002.
3. Kirk Allen Evans, Ashwin Kamanna, Joel Mueller, “XML and ASP.NET”, Pearson Education, 2002.
4. Pro ASP.NET 2.0 in C# 2005-Matthew Macdonald and Mario Szpuszta-Apress
5. C# 2008 for programmers –Third Editon-Deitel developer series:Paul J.Deitel and Harvey M.Deitel :Pearson.
6. Murach’s ASP.NET 2.0 web programming C# 2005-Jeel Murach & Anne Boehm:SPD(Shroff publishers & Distributors pvt.Ltd)
7. Ajax The Definitive Guide: 2008 First Edition –Anthony T.Holdener III -SPD(Shroff publishers & Distributors Pvt.Ltd)

2014-2015 Onwards	ADVANCED DATABASE MANAGEMENT SYSTEMS (14P2IT07)	M.Sc. Information Technology
II Semester		Core: Theory
Hours: 50		Credit : 4

Objectives

- Understand the role of a database management system in an organization.
- Design and implement a small database project using Microsoft Access.
- Understand the concept of a database transaction and related database facilities, including concurrency control, journaling, backup and recovery, and data object locking and protocols.

UNIT – I

Hour: 8

Advanced Data Modeling: Extended Entity Relationship Model, Entity Clustering, Entity Integrity, Design Cases. - Advanced SQL: Relational Set Operators, SQL Join Operators, Sub queries and Correlated Queries, SQL Functions, Views, Procedural SQL, Embedded SQL - Database design: SDLC, DBLC.

UNIT - II

Hour: 9

Advanced Database concepts: Transaction Management and Concurrency Control - Database Performance Tuning and Query optimization - Distributed Database Management Systems.

UNIT - III

Hour: 12

Object Oriented Databases – Introduction – Evolution of Object Oriented Concepts- Object Oriented Concepts – Characteristics of an Object Oriented Data Models – OODM and Previous Models - OODBMS – How Object Orientation affects Database Design – Advantages and Disadvantages of OODBMS. Databases in Electronic Commerce.

UNIT -IV

Hour: 11

Web Databases Development: Internet Technologies and Databases – Typical Uses of Internet Databases - Web to Database Middleware: Server Side Extensions - The Web Browser - Internet Database Systems: Special Considerations - Database Administration.

UNIT - V

Hour: 10

Enhanced Data Models for Advanced Applications - Emerging Database Technologies and Applications: Mobile Database – Multimedia Database - Geographic Information Systems – Genome Data Management.

TEXT BOOK:

1. Peter Rob and Carlos Coronel, “Database Systems – Design, Implementation and Management”, Cengage Learning, 7th Edition, 2007. (Unit- I : Chapter6, 8 &9, Unit-II : Chapter 10,11&12)

2. Peter Rob and Carlos Coronel, “Database Systems – Design, Implementation and Management”, Thompson Learning, Course Technology, 5th Edition, 2003.
(Unit – III :Chapter11&14, Unit –IV : Chapter15.1, 15.2, 15.3,15.4,15.6&16)
3. Ramez Elmasri, Shamkant B.Navathe, “Fundamentals of Database Systems”
5/E,Pearson Education, (Unit-V : Chapter 24&30)

REFERENCE BOOKS

1. Thomas M. Connolly, Carolyn E. Begg, “Database Systems - A Practical Approach to Design , Implementation , and Management”, Third Edition , Pearson Education, 2003.
2. Gary W. Hansen and James V. Hansen, Database Management and Design, Prentice Hall of India Pvt Ltd, 1999.
3. C.S.R.Prabhu, “Object Oriented Database Systems”, PHI, 2003.
4. M.Tamer Ozsü , Patrick Ualduriel, “Principles of Distributed Database Systems”, Second Edition, Pearson Education, 2003.

2014-15 Onwards	DATA MINING AND WAREHOUSING (14P2IT08)	M.Sc Information Technology
II Semester		Core: Theory
Hours:50		Credit:4

Objectives

- To understand and implement classical models and algorithms in data warehousing and data mining.
- Learn how to analyze the data, identify the problems, and choose the relevant models and algorithms to apply

UNIT I

Hours:12

Introduction: What motivated data mining?-Why is it important?-What is data mining?-Data mining-On what kind of data?-Data mining Functionalities-Classification of Data mining-Data mining task primitives-Integration of a Data mining System with a Database or Data Warehouse System-Major issues in Data mining

UNIT II

Hours: 09

Data Preprocessing: Why Preprocess the Data?-Descriptive Data Summarization-Data Cleaning-Data Integration and Transformation-Data Reduction-Data Discretization and Concept Hierarchy Generation

UNIT III

Hours: 10

Mining Frequent patterns, Associations and Correlations: Mining various kinds of association Rules-Classification and Prediction: What is Classification? What is Prediction? Issues regarding classification and Prediction-Bayesian Classification-Classification by Back propagation-Prediction

UNIT IV

Hours: 10

Types of Data in cluster Analysis-Categorization of major Clustering methods Hierarchical methods-Density-based Methods-Spatial Data mining-Text mining-Data Mining Applications-Social Impacts of data mining-Trends in data mining

UNIT V

Hours: 09

Data Warehouse and OLAP Technology: What is Data Warehouse? A Multidimensional Data Model-Data Warehouse Architecture-Data Warehouse Implementation

Text Book

1. Jiawei Han and Micheline Kamber, "DATA MINING Concepts and Techniques", Morgan Kaufmann Publishers, Second Edition, 2006

Reference Books

1. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008.
2. Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Limited, 2001.
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.

2014-2015 Onwards	MULTIMEDIA LAB (14P2ITP02)	M.Sc. Information Technology
II Semester		Core: Practical
Hours: 50		Credit : 2

The following programs are suggested to be done for the Multimedia Lab by using the specified softwares:

I. SOFTWARE – MACROMEDIA – DIRECTOR 6

1. Text Handling (Size Changing, Animation).
2. Play School teaching aid (Like alphabet teaching with pictures).
3. Company annual report presentation (should include any type of graph denoting the sales of the company and the other important features).
4. Department profile (should include the details about the staff and the laboratory facilities).
5. Animation of 3D object with sound.

II. SOFTWARE – FREEHAND 8

1. Designing the college gate.
2. Text Handling (Moving, Duplicating, Scaling, Rotating, Changing the alignment and orientation).
3. Greetings card design (Like scenery, group of birds, bunch of flowers, etc...).

III. SOFTWARE – AUTHORWARE 5

1. Quiz Design (should include multiple choice questions with necessary pictures, value the answers, and feedback the results).

IV. SOFTWARE – ADOBE – PREMIERE, PHOTOSHOP

1. Product Advertisement (for automobile products with the animated picture and necessary features).

V. SOFTWARE – MACROMEDIA – FLASH 8

1. Perform Motion Tuning by writing Script.
2. Generate any one game.

2014-2015 Onwards	.NET LAB	M.Sc. Information Technology
II Semester	(14P2ITP03)	Core: Practical
Hours: 50		Credit : 2

Develop the following On-line Applications using ASP.NET.

1. Personal Information System
2. Banking System
3. Shopping System
4. Air-line Reservation System
5. Recruitment System
6. Quiz program.
7. Library Management
8. Handling Application state (using session) with a simple web application
9. Mailing system
10. Query analyzer (Query textbox and Displaying records)
11. Search Engine using AJAX
12. To implement a simple web application using AJAX

ELECTIVES

2014-2015 Onwards	NETWORK SECURITY (14P1ITE01)	M.Sc. Information Technology
I Semester		Elective: Theory
Hours: 50		Credit : 4

Objectives

- Identify and explain the concepts, policies, and technologies associated with a layered and diversified defense-in-depth strategy.
- Define the concepts of auditing in a network, including the types of audits and the handling of data.

UNIT – I

Hours: 09

Introduction: Security Trends-The OSI Security Architecture - Security Attacks - Security Services- Security Mechanisms- Model for Internetwork Security - Internet Standards and the Internet Society. Symmetric Encryption and Message Confidentiality: Symmetric Encryption Principles - Symmetric Block Encryption Algorithms - Stream Ciphers and RC4 - Cipher Block Modes of Operations - Location of Encryption Devices-Key Distribution.

UNIT - II

Hours: 10

Public Key Cryptography and Message Authentication: Approaches to Message Authentication – Secure Hash Functions and HMAC - Public Key Cryptography Principles - Public Key Cryptography Algorithms - Digital Signatures - Key Management Authentication Applications: Kerberos - X.509 Authentication service - Public Key Infrastructures.

UNIT - III

Hours: 11

Electronic mail Security: Pretty Good Privacy(PGP) - S/MIME. IP Security: IP Security Overview – IP Security Architecture - Authentication Header - Encapsulating Security Payload - Combining security Associations - Key Management.

UNIT - IV

Hours: 09

Web Security: Web Security Considerations- Security Sockets Layer (SSL) and Transport Layer Security (TLS) - Secure Electronic Transaction. Network Management Security: Basic Concepts of SNMP - SNMPV1 Community facility - SNMPV3.

UNIT-V

Hours: 11

Intruders: Intruders – Intrusion Detection – Password Management - Malicious Software: Viruses and Related Threats – Virus Countermeasures – Distributed Denial of Service Attacks. Firewalls: Firewall Design Principles – Trusted Systems – Common Criteria for IT Security Evaluation.

TEXT BOOK

1. William Stallings, “Network Security Essentials – Applications and Standards”, 3rd Edition, Pearson Education, 2009 Edition.
Unit I : Chapter 1 & 2 , Unit II : Chapter 3 & 4, Unit III : Chapter 5 & 6,
Unit IV : Chapter 7 & 8, Unit-V (Chapter 9, 10 & 11)

REFERENCE BOOKS

1. V.K.Pachghare , “Cryptography and Information Security” , PHI 2010.
2. William Stallings, “Cryptography and Network Security”, Pearson Education - 2008.
3. Behrouz A Forouzan, Sophia Chung Fegan, “Data Communications and Networking”, TMH-2006.

2014-2015 Onwards	SOFTWARE PROJECT MANAGEMENT AND QUALITY ASSURANCE (14P1ITE02)	M.Sc. Information Technology
I Semester		Elective: Theory
Hours: 50		Credit : 4

Objectives

- To understand the fundamental principles of Software Project management & will also have a good knowledge of responsibilities of project manager and how to handle these.
- Be familiar with the different methods and techniques used for project management.

UNIT-I

Hours: 09

Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Metrics.

UNIT -II

Hours: 10

Software Configuration Management – Definitions and terminology – processes and activities – Configuration Audit – Metrics – Software Quality Assurance – Definitions – Quality Control and Assurance – SQA Tools – Organization of Structures – Risk Management – Risk Identification, Monitoring.

UNIT-III

Hours: 09

Project initiation – Project Planning and Tracking – What, Cost, When and How – Organizational Processes – Assigning Resources – Project Tracking – Project Closure – When and How.

UNIT – IV

Hours: 11

Concepts of Quality Control, Quality Assurance, Quality Management - Total Quality Management; Cost of Quality; QC tools - 7 QC Tools and Modern Tools; Other related topics - Business Process Re-engineering –Zero Defect, Six Sigma, Quality Function Deployment, Benchmarking, Statistical process control.

UNIT - V

Hours: 11

Software Engineering Principles, Software Project Management, Software Process, Project and Product Metrics, Risk Management, Software Quality Assurance; Statistical Quality Assurance - Software Reliability, Muse Model; Software Configuration Management; Software Testing; CASE (Computer Aided Software Engineering).

TEXT BOOKS

1. Gopaldaswamy Ramesh, “Managing Global Software Projects” Tata McGraw Hill Publishing Company Ltd, New Delhi, 2002. (Unit-I :Chapter 1,2,3,4&5, Unit-II: Chapter 6,7&8, Unit-III: Chapter 10,11 & 12)
2. Pressman, Roger, “Software Engineering ”, A Practitioner's approach, 7th edition, Tata Mc-Graw Hill, 2006. 6th Edition (Unit-IV: Chapter 26,27 Unit-V: 5,15,21,25 &31)

REFERENCE BOOKS

1. Philip B Crosby, " Quality is Free: The Art of Making Quality Certain ", Mass Market, 2004.
2. Bob Hughes and Mike Cotterell “Software Project Management”2nd edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.
3. Watts Humphery, “Managing Software Process ”, Addison - Wesley, 2000

2014-2015 Onwards	ADVANCED NETWORKS (14P1ITE03)	M.Sc. Information Technology
I Semester		Elective: Theory
Hours: 50		Credit : 4

Objectives

To encourage a performance perspective towards analysis of computer and communication networks.

UNIT-I

Hours: 10

ISDN Overview: The Integrated Digital Network – A Conceptual Overview of ISDN – ISDN Standards – ISDN Interfaces and Functions: Transmission Structure – User-Network Interface Configuration – ISDN Protocol Architecture – ISDN Connections – Addressing – Inter Networking. ISDN Physical Layer: Basic User-Network Interface – Primary Rate user-Network Interface - U Interface.

UNIT-II

Hours: 10

ISDN Data Link Layer: LAPD – Terminal Adaptation – Bearer Channel Data Link Control Using I.465 / V.120,207. – ISDN Network Layer: Overview – Basic Call Control – Control of Supplementary Services - ISDN Services: Service Capabilities – Bearer Services and Teleservices – Basic and Supplementary Services.

UNIT – III

Hours: 12

Frame Relay Protocols & Services: Frame –Mode Protocol Architecture – Frame Mode Call Control – LAPF – Frame Relay Congestion Control: Congestion in Frame Relay Network- Approaches to Congestion Control – Traffic Rate Management – Explicit & Implicit Congestion Control – Broad Band ISDN –Architecture: Requirements – Architecture . Broad Band ISDN Protocol: B-ISDN Protocol Reference Model – B- ISDN Physical Layer – SONET / SDH.

UNIT – IV

Hours: 09

ATM Layer: Introduction – ATM Cell header Structure at UNI - ATM Cell header Structure NNI – ATM Layer Functions – ATM Adaptation Layer : ATM Traffic & Service Parameterization – ATM Traffic Management – ATM Switching.

UNIT – V

Hours: 09

ATM Addressing: ATM End System Addressing (AESAs) Format – ATM Group Addressing – Acquiring ATM Address – ATM Name System. – ATM Signaling –ATM Routing – ATM Network Management – ATM Security.

TEXT BOOKS

1. William Stallings, “ISDN and Broad Band ISDN with Frame Relay and ATM “ , Pearson Education , Fourth Edition, Second Impression -2009.(Unit-I:Chapter-5,6&7, Unit-II:Chapter-8,9&10, Unit-III:Chapter-12,13,14&15)
2. Sumit Kasera, ”ATM Networks Concepts & Protocols”, Tata MC Graw Hill, Second Edition, Eighth Reprint–2008.(Unit-IV:Chapter-5,6,7,8 & 9, Unit-V:Chapter-10,11,12,14 &15)

REFERENCE BOOKS

1. John M.Griffiths,"ISDN Explained",4th Edition, March 2005,Willey & Sons.
2. Koji Kobayashi, "Computer And Communications ",The MID Press (A Version of C and C) 1986.
3. Walter,J., Gooralski,J., "Introduction to ATM networking ",2003 ,Tata MC Graw-Hill.

2014-2015 Onwards	EMBEDDED SYSTEMS (14P2ITE04)	M.Sc. Information Technology
II Semester		Elective: Theory
Hours: 50		Credit : 4

Objectives

To have a knowledge and understanding of fundamental embedded systems design paradigms, architectures, possibilities and challenges, both with respect to software and hardware.

UNIT – I

Hours: 10

Introduction to Embedded Systems-Categories of embedded Systems-specialties of embedded systems- requirements of embedded systems –challenges and issues in embedded software development – recent trends in embedded systems-Architecture of embedded systems: Hardware architecture – software architecture-application software – Communication software –Embedded systems on a Chip (SoC) and the use of VLSI designed circuits.

UNIT – II

Hours: 09

Processor and memory organization-Devices and buses for Device Networks-Device drivers and Interrupt servicing mechanism.-program modeling concepts in single and multiprocessor systems software-development process.

UNIT – III

Hours: 11

Software Engineering Practices in the Embedded software development process- Inter-process communication and synchronization of process, tasks and threads- Hardware-software co-design in an embedded system.

UNIT – IV

Hours: 11

Hardware software co-design and program modeling-Embedded hardware design and development-embedded firmware design and development-Real-time operating system (RTOS) based embedded system design.

Hours: 09

UNIT V

Introduction to Embedded System design with vx works and MicroC/OS-II RTOS- Integration and Testing of embedded hardware and firmware-embedded system development environment-embedded product development life cycle(EDLC)

TEXT BOOKS

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw- Hill, Twelfth Reprint 2007. (Unit- I: Chapter 1, Unit –II: Chapter 2,3,4 &6, Unit- III: Chapter 7,8 &12)
2. Introduction to Embedded systems – SHIBU K V TATA McGraw- Hill 2009(Unit – IV: Chapter - 8,9&10, Unit-V: Chapter 11,12,13 & 15)

REFERENCE BOOKS

1. Embedded system design, ARNOLD S.BERGER ,south Asian edition –2005
2. Embedded system design ,Frank Vahid/Tony givargis-reprint-2009

2014-2013 Onwards	OBJECT ORIENTED ANALYSIS AND DESIGN (14P2ITE05)	M.Sc. Information Technology
II Semester		Elective: Theory
Hours: 50		Credit : 4

Objectives

- To develop a working understanding of formal object-oriented analysis and design processes.
- To develop an understanding of the application of OOAD practices from a software project management perspective

UNIT-I

Hours : 10

The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of the Object – Relationships among Objects-The Nature of a Class – Relationships among Classes – The Interplay of Classes and Objects – On Building Quality Classes and Objects.

UNIT-II

Hours : 10

Classification: The Importance of Proper Classification – Identifying Classes and Objects – Key Abstractions and Mechanisms. The Notation: Elements of the Notation – Class Diagrams – State Transitions Diagrams – Object Diagrams – Interaction Diagrams – Module Diagrams – Process Diagrams – Applying the Notation.

UNIT – III

Hours : 12

The Process: First Principal – The Micro Development Process - The Macro Development Process – Pragmatics: Managements and Planning – Staffing – Release Managements – Reuse – Quality Assurance and Metrics – Documentation – Tools – Special Topics – The Benefits and Risks of Objects – Oriented Developments.

UNIT – IV

Hours: 09

UML: Introduction- Development Process- Class Diagrams: The Essentials- Sequence Diagrams. Class Diagrams: Advanced Concepts.

UNIT – V

Hours: 09

Object Diagrams-Package Diagrams – Deployment diagrams-Use Cases-State Machine Diagrams – Activity Diagrams-Communication Diagrams-Composite structures-Component Diagrams-Collaborations- Interaction Overview Diagrams- Timing Diagrams.

TEXT BOOKS:

1. Grady Booch, ” Object-Oriented Analysis and Design”, Pearson Education, 2nd Edition, Third Impression 2008. (Unit-I:Chapter-2&3 Unit-II : Chapter-4 & 5, Unit-III:Chapter-6 &7)
2. Martin Fowler & Co ,” UML Distilled “,” Pearson Education, 3rd Ed.- 2004. Unit-IV:Chapter-1,2,3,4 & 5, Unit-V:Chapter-6 to 17)

REFERENCE BOOKS:

1. Object Oriented Modeling and Design By James Rumabaugh , Michael Blaha, Prentice Hall - 2006.
2. Ali Brahmi , "Object Oriented System Development " TMH Intl Edition -2007.

2014-2015 Onwards	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS (14P2ITE06)	M.Sc. Information Technology
II Semester		Elective: Theory
Hours: 50		Credit : 4

Objectives

- To identify the AI problems (search, inference, decision making under uncertainty, game theory)
- To implement, evaluate and compare the performance of various AI algorithms.

UNIT I

Hours: 10

Introduction - The AI problems – AI techniques – problems, problems space & search – Defining the problem as a state Search – Production systems – problem characteristics – heuristic search techniques – Generate & test – Hill climbing – Best first search- Problem reduction-Constraint Satisfaction-mean-end Analysis.

UNIT II

Hours: 14

Using Predicate Logic: Representing Simple Facts in Logic-Representing Instance and ISA Relationships-Computable Functions and Predicates-Resolution-Netural Deduction. Game playing : Overview-The Mini-max Search procedure – Adding Alpha – Beta cutoffs – Additional refinements –Interactive deepening.

UNIT III

Hours: 13

Representing knowledge using Rules – Procedural verses declarative knowledge- logic programming – forward versus backward reasoning –matching – control knowledge. Symbolic Reasoning under Uncertainty-Statistical Reasoning.

UNIT IV

Hours: 06

Introduction to Expert Systems- Representing and using Domain Knowledge- xpert System Shells-Explanation-Knowledge Acquisition.

UNIT V

Hours: 07

Weak slot –and-filler structures: semantic nets- frames. Strong slot and filler structures- conceptual dependency- scripts- CYC.

TEXT BOOKS

1. Elaine Rich, Kevin Knight and Shivashankar B. Nair – Artificial Intelligence - Tata McGraw Hill, NewDelhi – Third Edition, 2010.
Unit-I :Chapter-1,2&3, Unit-II:Chapter-5&12, Unit-III:Chapter-6,7&8).
2. Donald A.Waterman – A Guide to Expert Systems Tata McGraw Hill – Second Edition, 1991. (Unit – IV & V).

REFERENCE BOOK

1. Stuart Russell & Peter Norving - Artificial Intelligence - A Modern Approach – Second Edition, 2007.

Subject Title	Open Source Technologies	Semester	III
Subject Code	16P3IT09	Specialization	NA
Type	Core Course	L:T:P:C	5 : 0 : 0 : 4
Objectives			
<ul style="list-style-type: none"> To enable the students to learn the concepts of open source, XML, PHP and MYSQL 			
Unit	Syllabus Contents	Number of Sessions	
I	Open Source: Definition – Application of Open Source, Advantages and disadvantages of open source –benefits of open source – commercial aspects of open source – open source operating system: introduction of Linux.	10	
II	Introduction: What is XML? – Origin Of the XML Standards - Where XML Can Be Used, And What U Can Use it For. Well-Formed XML: Parsing XML – Attributes - Comments –Empty Elements - XML Declaration - Processing Instructions – Illegal PCDATA Characters - Errors in XML. Validation: Document Type Definitions.	10	
III	Introduction to PHP: Sending data to the Web Browser – Variables & Strings – Programming with PHP & Creating HTML: Handling HTML Form & Operators-Validating Form Data & Arrays – Introduction to MySQL: Creating Database columns – Introduction to SQL: Inserting Records & Select Data.	11	
IV	Advance SQL and MySQL:DB Design-Normal Forms - Performing Transactions - Error Handling and Debugging : Introduction – Displaying PHP Errors – PHP Debugging Techniques – Creating Custom error handlers – Using PHP with MySQL: Introduction – Connecting to MySQL – Security & Updation with PHP .	10	
V	Cookies and Sessions: Making Login Page – Using Sessions – Security Methods:Preventing Spam – Preventing XSS & SQL Injection Attacks – Database Encryption - Perl-Compatible Regular Expression: Introduction – Defing Simple Patterns - Finding Matches & Using Modifiers.	09	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. David Hunter, Jeff Rafter, Joe Fawcett, Eric Van der Vlist ,Danny Ayers, John Duckett, Andrew Watt, Linda McKinnon “Beginning XML 4th Edition”, -Wiley India Pvt. Limited -2008. Unit I- Chapters 1,2,4 Unit II –Chapter 11, 12, 15. 2. Lary Ullman , “PHP6 AND MySQL5 For Dynamic Web Sites” -, Pearson Education – 2008.Unit III - Chapter 1, 2, 4,5, Unit IV- Chapters 6,7,8 Unit V, Chapters 11, 12, 13.
Reference Books	<ol style="list-style-type: none"> 1. Chris Bates “Web Programming, Building Internet Applications”, 3rd Edition, April 2006, WILEY Dreamtech. 2. Michael j. Young “Step by Step XML?” Microsoft Press, 2002.
Web Sites/Links	<ol style="list-style-type: none"> 1. http://www.computerworld.com/open-source-tools/five-open-source-technologies.html 2. http://searchsoa.techtarget.com/definition/XML 3. https://www.php.net 4. https://www.codecademy.com/tracks/php

Content beyond the syllabus:

1. Open Source Operating System (Solaris)
2. Open Source web server
3. Eclipse IDE platform

Subject Title	High Performance Computing	Semester	III
Subject Code	14P3IT10	Specialization	NA
Type	Core Course	L:T:P:C	5 : 0 : 0 : 4
Objectives			
<ul style="list-style-type: none"> To enable the students to learn the concepts of advances in networking techniques. Understood the advanced trends and Principals of Grid, cluster and cloud Computing 			
Unit	Syllabus Contents	Number of Sessions	
I	Grid Computing - The data Centre, the Grid and the distributed/ High performance computing – Cluster computing and Grid computing – Meta computing –Scientific, business and E-Governance Grids, Developing Grid Computing Toolkits & Frameworks -web services and Grid computing.	12	
II	Technologies and architecture for Grid computing – Web services and the Service oriented Architecture(SOA)- OGSA for Resource distribution – Stateful web services in OGSA – Web services Resource Framework(WSRF) – Resource approach to stateful Services – WSRF specification – The Grid and the databases	10	
III	Approaches to parallel computing – How to achieve low cost parallel computing through clusters – Definition and architecture of a cluster – Cluster Middleware : An Introduction – Levels and layers of single system Image(SSSI) – Cluster middleware design objectives – Resource Management and scheduling – Cluster programming environment and tools.	10	
IV	Fundamentals – Short history of cloud computing – Cloud Architecture – Cloud Storage–Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing-Security-Regulatory issues.	10	
V	Need for Web-Based Application – The pros and cons of cloud service development – Types of Cloud Service Development: Software as a service-Platform as a service-Web Services-On demand Computing – Cloud Service development tools.	08	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. C.S.R Prabhu, Grid and Cluster computing, Prentice Hall of India, 2008. (Units I, II & III). 2. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que, 2008. (Units IV & V).
Reference Books	<ol style="list-style-type: none"> 1. Fran Berman, Geoffrey Fox, J.G. Anthony Hey, “Grid Computing: Making the Global Infrastructure a reality”, John Wiley & sons, 2003. 2. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson Education, 2004. 3. Hmar Abbas, “Grid Computing: A Practical Guide to technology and Application Charles River media, 2003.
Web Sites/Links	<ol style="list-style-type: none"> 1. http://insidehpc.com/hpc-basic-training/what-is-hpc/ 2. https://www.techopedia.com/definition/4595/high-performance-omputing 3. www.elsevier.com 4. www.springer.com 5. www.faadooengineers.com

Content beyond the syllabus

1. Fault Tolerance using grid computing
2. Applications using Grid and cloud
3. Advanced concepts using cloud

Subject Title	Cyber Crime and Security	Semester	III
Subject Code	14P3IT11	Specialization	NA
Type	Core Course	L:T:P:C	6 : 0 : 0 : 4
<u>Objectives</u>			
To understand about security and services, tools and methods used in cyber crime, Cyber security measures, Organizational structures and International Cooperation for Cyber security			
Unit	Syllabus Contents	Number of Sessions	
I	UNIT – I Introduction to Cyber Crime Introduction to Cyber Crime – Definitions – Cyber Crime and Information Security – Cyber Criminals – Classification of Cyber Crimes – Legal perspective of Cyber Crime – An Indian perspective - Cyber Crime and the Indian ITA 2000 – Categories of Cyber Crime – Social Engineering – Cyber Stalking.	10	
II	UNIT – II Tools and Methods used in Cyber Crime Tools and Methods used in Cyber Crime – Proxy Server and Anonymizers – Phishing – Password Cracking – Keyloggers and Spywares – Virus and Worms – Trojan Horses and Back Doors – Steganography – DoS and DoS Attacks – SQL Injection – Buffer Overflow – Attacks on Wireless Networks.	12	
III	UNIT – III Introduction to Computer Forensics Introduction – Historical background of Cyberforensics – Digital Forensic Science – The need for Computer Forensics – Cyber forensics and Digital Evidence – Forensic Analysis of E-Mail – Digital Forensics Life Cycle – Chain of Custody Concept – Network Forensic – Approaching a Computer Forensic Investigation – Computer Forensics and Steganography – Relevance of the OSI 7 Layer Model to Computer Forensics –Forensics Auditing.	12	
IV	Introduction to Computer Forensics Computer Forensics – definition and Introduction, Understanding cell phone working characteristics – Hand Held Devices and digital forensics – Challenges in forensics of the digital images and still camera – Toolkit for hand held device forensics.	10	
V	Cyber Security Introduction – Cost of Cyber Crimes and IPR Issues – Web Threats for Organizations – Security and Privacy Implications from Cloud Computing – Social Media Marketing: Security Risks, perils for organizations - Incident Handling – Forensics best practices for organizations.	10	

Learning Resources	
Text Books	1. Nina Godbole & Sunit Belapure “Cyber Security”, Wiley India, 2012.
Reference Books	<ol style="list-style-type: none"> 1. Harish Chander, “Cyber Laws & IT Protection”, PHI Learning Private Limited, 2012. 2. Dhiren R Patel, “Information Security Theory & Practice”, PHI Learning Private Limited, 2012. 3. MS.M.K.Geetha & Ms.Swapne Raman, “Cyber Crimes and Fraud Management”, Macmillan Publishers, 2012. 4. Pankaj Agarwal : Information Security & Cyber Laws (Acme Learning), Excel, 2013. 5. Vivek Sood, Cyber Law Simplified, Tata McGraw Hill Publications, 2012.
Web Sites/Links	<ol style="list-style-type: none"> 1. www.cybercellmumbai.gov.in 2. www.authorstream.com 3. www.intel.int/crime 4. www.wileyindia.com 5. www.ibm.com

Content beyond the syllabus

1. Cyber Crime In Cloud Computing
2. Forensics Of Black Berry Wireless Device
3. Attacks On Mobile / Cell Phones

Subject Title	Open Source Technologies Lab	Semester	III
Subject Code	14P3ITP04	Specialization	NA
Type	Core	L:T:P:C	0 : 0 : 2 : 2

I. Develop the following online Programs using XML.

1. To prepare CD Catalogs data as .xml file and view that data through xmlDoc object.
2. Write a program for xml validations.
3. Develop a book store data as .xml file and view that data through XML-DOM (loadXMLDoc() or loadXMLString())functions.
4. Write a simple program using SAX Events.

II. Develop the following online applications using PHP & MySQL

5. Students Feedbacks System.
6. Job Registrations.
7. Library Management System.
8. Banking Transaction System.
9. Simple Shopping Application.
10. Getting Web Data using Cookies Object.
11. Webpage Kit Counters using Session.
12. Airline Reservation System.

Subject Title	Project Work	Semester	III
Subject Code	14P3ITPR01	Specialization	NA
Type	Project Work	L:T:P:C	0 : 0: 2 : 1

MINI PROJECT WORK

Mini Project

FIRST REVIEW:

(15 Marks)

1. Project Title
2. Project Platform
3. Details of Guide
4. Problem Description / Modules
5. Presentation (PPT)

FINAL REVIEW:

(25 Marks)

1. Documentation
2. Screens Shots
3. DFD / ERD / System Flow Diagram (Whichever Applicable)
4. Presentation (PPT)
5. Final Project Report (with executable format including complete source code)

The Passing minimum shall be 40% out of 60 marks (24 Marks)

Subject Title	Soft Computing Techniques	Semester	IV
Subject Code	14P4IT12	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 4

Objectives

To learn basic neural networks, fuzzy systems, and optimization algorithms concepts and their relations.

Unit	Syllabus Contents	Number of Sessions
I	Soft Computing: Introduction of Soft Computing-Soft Computing vs. Hard Computing-various types of Soft Computing techniques-Applications of Soft Computing. Fundamentals of Neural Networks: Basic Concepts of Neural Network-Model of an Artificial Neuron-Neural Network Architectures- Characteristics of Neural Networks-Learning Methods-Early Neural Network Architectures-Some applications domain.	10
II	Back propagation Networks: Architecture of Back propagation Network-Back propagation Learning –illustrations-Effect of Tuning Parameters of the Back propagation Neural Network-Selection of various parameters in Back propagation Neural Network-Variations of Standard Back propagation algorithms.	10
III	Supervised Learning Neural Networks: Introduction - Perceptron - Adaline – Multiple Adaptive Linear Neurons – Radial Basis Function Networks. Unsupervised Learning Neural Networks: Introduction – Fixed Weight Competitive Nets – Kohonen Self Organizing Feature Maps – Learning Vector Quantization – Adaptive Resonance Theory Network.	10
IV	Fuzzy logic: Fuzzy Set Theory: Fuzzy versus Crisp - Fuzzy Sets: Membership Function-Basic Fuzzy set operations-Properties-Fuzzy Relations: Fuzzy Cartesian Product-Operations. Fuzzy Systems: Fuzzy Logic-Fuzzy Rule based system-Defuzzification Methods-Applications.	10
V	Genetic Algorithm: Introduction – Biological Background – Genetic Algorithm and Search Space – Genetic Algorithm Vs Traditional Algorithm – Basic Terminologies in Genetic Algorithm – Simple Genetic Algorithm – General Genetic Algorithm – Operators – Stopping Condition in Genetic Algorithm Flow – Constraints in Genetic Algorithm – Advantages and Limitations of Genetic Algorithm- Applications of Genetic Algorithm.	10

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. Rajasekaran. S and VijayalakshmiPai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, New Delhi-2011 (fifteenth edition) (Unit I,II,IV) 2. Sivanandam. S. N and Deepa S. N, Principles of Soft Computing, 2 ND Edition Wiley India, 2012.(Unit III & V)
Reference Books	<ol style="list-style-type: none"> 1. Fakhreddine O. Karray, Clarence De Silva, Soft Computing and Intelligent Systems Design, Pearson, 2009. 2. Sudarshan K. Valluru and T.Nageswara Rao, Introduction to Neural Network and Genetic Algorithm Theory and Applications,Pashupathi Printers Ltd,New Delhi, 2010. 3. KwangH.Lee, First Course on Fuzzy Theory and Applications,Springer International Edition,2009. 4. AmirthavalliM,Fuzzy Logic and Neural Network,Scitech Publications Pvt.Ltd,2007
Web Sites/Links	<ol style="list-style-type: none"> 1. www.banasthali.org 2. www.soft-computing.de/def.html

Content beyond the syllabus:

1. Applications using ANN
2. Scope of Soft Computing Techniques
3. Study about “R” Tools

Subject Title	Soft Computing	Semester	I
Subject Code	17P1ITE02	Specialization	NA
Type / Hours	Elective Course / 60 Hours	L:T:P:C	4 : 0 : 0 : 4
Objectives			
<ul style="list-style-type: none"> To learn basic neural networks, fuzzy systems, and optimization algorithms concepts and their relations 			
Unit	Syllabus Contents	Number of Sessions	
I	Soft Computing: Introduction of Soft Computing-Soft Computing vs. Hard Computing-various types of Soft Computing techniques-Applications of Soft Computing.	12	
II	Back propagation Networks: Architecture of Back propagation Network-Back propagation Learning –illustrations-Effect of Tuning Parameters of the Back propagation Neural Network	12	
III	Supervised Learning Neural Networks: Introduction - Perceptron - Adaline – Multiple Adaptive Linear Neurons – Radial Basis Function Networks. Unsupervised Learning Neural Networks: Introduction – Fixed Weight Competitive Nets – Kohonen Self Organizing Feature Maps – Learning Vector Quantization – Adaptive Resonance Theory Network.	12	
IV	Fuzzy logic: Fuzzy Set Theory: Fuzzy versus Crisp - Fuzzy Sets: Membership Function-Basic Fuzzy set operations-Properties-Fuzzy Relations: Fuzzy Cartesian Product-Operations. Fuzzy Systems: Fuzzy Logic-Fuzzy Rule based system-Defuzzification Methods-Applications.	12	
V	Genetic Algorithm: Introduction – Biological Background – Genetic Algorithm and Search Space – Genetic Algorithm Vs Traditional Algorithm – Basic Terminologies in Genetic Algorithm – Simple Genetic Algorithm – General Genetic Algorithm – Operators – Stopping Condition in Genetic Algorithm Flow – Constraints in Genetic Algorithm – Advantages and Limitations of Genetic Algorithm- Applications of Genetic Algorithm.	12	

Learning Resources	
Text Books	<ol style="list-style-type: none"> Rajasekaran. S and VijayalakshmiPai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, New Delhi-2011 (fifteenth edition) (Unit I,II,IV) Sivanandam. S. N and Deepa S. N, Principles of Soft Computing, 2 ND Edition Wiley India, 2012.(Unit III & V)
Reference Books	<ol style="list-style-type: none"> Fakhreddine O. Karray, Clarence De Silva, Soft Computing and Intelligent Systems Design, Pearson, 2009. Sudarshan K. Valluru and T.Nageswara Rao, Introduction to Neural Network and Genetic Algorithm Theory and Applications,Pashupathi Printers Ltd,New Delhi, 2010.

	<ol style="list-style-type: none">7. KwangH.Lee, First Course on Fuzzy Theory and Applications, Springer International Edition, 2009.8. AmirthavalliM, Fuzzy Logic and Neural Network, Scitech Publications Pvt.Ltd, 2007
Web Sites/Links	<ol style="list-style-type: none">3. www.banasthali.org4. www.soft-computing.de/def.html

Subject Title	Distributed Computing	Semester	IV
Subject Code	14P4IT13	Specialization	NA
Type	Core	L:T:P:C	5 : 0 : 0 : 4
<u>Objectives</u>			
<ul style="list-style-type: none"> To expose students to both the abstraction and details of file systems. <p>To introduce concepts related to distributed computing systems</p>			
Unit	Syllabus Contents	Number of Sessions	
I	Introduction: Definition Of distributed system- goals - Types of Distributed Systems Architectures: Architectural Styles - System Architectures - Architectures Vs Middleware – Self-Management in Distributed Systems. Processes: Threads – Virtualization - Clients Servers - Code Migration- Applications Using Distributed Computing	10	
II	Communication: Fundamentals - Remote Procedure Call – Message-Oriented Communication – Stream-Oriented Communications - Multicast Communication. Naming: Names, Identifiers and Addresses - Flat Naming - Structured Naming –Attribute-Based Naming- Parallel Computation in Distributed Computing	11	
III	Synchronization: Clock Synchronization - Logical Clocks - Mutual Exclusion -Global Positioning of Nodes - Election Algorithms. Consistency and Replication: Introduction – Data-Centric Consistency Models – Client-Centric Consistency Models-Replica Management - Consistency Protocols.	09	
IV	Fault Tolerance: Introduction to Fault Tolerance - Process Resilience - Reliable Client-Server Communication - Reliable Group Communication - Distributed Commit- Recovery. Security: Introduction to Security - Secure Channels - Access Control -Security Management.	10	
V	Distributed Object-Based Systems: Architecture – Processes – Communication –Naming – Synchronization - Consistency and Replication – Fault Tolerance -Security. Distributed file system: Architecture –Processes-communication-Naming-Synchronization-Consistency and Replication - Fault Tolerance – Security – Distributed Web-Based Systems- Scope of Distributed Computing	10	

Learning Resources	
Text Books	<p>1. Andrew S.Tanenbaum, Maarten Van Steen, “Distributed Systems” Principles and Paradigms. Second Edition, PHI Publications, New Delhi - 2008.</p> <p>Unit-I (Chapters -1,2,&3) , Unit-II (Chapters- 4 & 5), Unit-III (Chapters-6 & 7), Unit-IV (Chapters-8 & 9), Unit-V (Chapter-(10,11 &12)</p>
Reference Books	<p>1. Birman, Kenneth P, “Reliable Distributed Systems - Technologies, Web Services, and Applications” , Springer Publications, 2005 Edition,</p> <p>2. G.coulouris, Jean Dollimore & Tim Kindberg,Distributed Systems: Concepts and Design (4th Edition) , Addison Wesley Publications, 2005 Edition</p>
Web Site / Links	<p>1. www.adarshpatil.com</p> <p>2. www.webopedia.com</p> <p>3. http://www.cs.uic.edu/</p> <p>4. www.b-u.ac.in/sde_book/distrib_computing.pdf</p> <p>5. https://www.wiziq.com/tutorials/distributed-computing</p> <p>6. www.buyya.com/hpcasia.html</p>

Content beyond the syllabus:

1. Applications using distributed computing.
2. Parallel computation in distributed computing.
3. Goals of distributed computing.

Subject Title	Web Technologies Lab	Semester	IV
Subject Code	14P4ITP05	Specialization	NA
Type	Practical	L:T:P:C	0 : 0 : 4 : 2

1. Simple Web page & Website design for a Department, college, company etc.
2. Exercises using Java script & VB script.
3. Three Tier Architecture Using JSP And Database
4. Web Server Based Programs
5. Exercises using XML

Subject Title	Mobile Computing	Semester	III
Subject Code	14P3ITE07	Specialization	NA
Type	Elective	L:T:P:C	5 : 0 : 0 : 4
<u>Objectives</u>			
<ul style="list-style-type: none"> To impart fundamental concepts in the area of mobile computing, to provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software, and to introduce selected topics of current research interest in the field 			
Unit	Syllabus Contents	Number of Sessions	
I	Introduction - Introduction to Telephone Systems - Mobile communication: Need for mobile communication - Requirements of mobile communication – History of mobile communication - Introduction to Cellular Mobile Communication- Applications using Mobile Computing	08	
II	Mobile Communication Standards - Mobility Management: Handoff Techniques – Handoff Detection and Assignment – Types of Handoffs – Radio Link Transfer – Roaming Management - Frequency Management - Cordless Mobile Communication Systems	10	
III	Mobile Computing: History of data Networks - Classification of Mobile data networks - CDPD System. Satellites in Mobile Communication - Global Mobile Communication – Mobile Internet - Wireless Network Security - Wireless Local Loop Architecture - Wireless Application Protocol-Scope of CDPD system in mobile computing	11	
IV	WCDMA Technology and Fiber Optic Microcellular Mobile Communication – Ad Hoc Network and Bluetooth Technology - Intelligence Mobile Communication System - Fourth Generation Mobile Communication Systems- Perspective of Fourth Generation Mobile Communication System	12	
V	Mobile network layer: Mobile IP – Dynamic host configuration protocol – Mobile Ad-Hoc networks. Mobile transport layer: Traditional TCP – Classical TCP Improvement – TCP over 2.5/3G Wireless networks – Performance enhancing proxies – Support for Mobility: File Systems – World Wide Web.	09	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. T.G. Palanivelu & R.Nakkeeran, “Wireless and Mobile Communication”, PHI Learning Private Limited, 2009.(Unit-I: Chapters–1,2,3,4. Unit-II: Chapters–5, 6, 7,8. Unit-III: Chapters– 9, 10, 11, 14, 15, 16,17. Unit-IV: Chapter– 18, 19, 20, 21.) 2. Jochen Schiller, “Mobile Communications”, Pearson Education, Second Edition , 2009.(Unit-V : Chapters-8,9 &10)
Reference Books	<ol style="list-style-type: none"> 1. S.William Stallings, “Wireless Communications and Networks”, Pearson Education, 2002. 2. Asoke K Talukder, “http://www.amazon.com/Mobile-Computing-Applications-McGraw-Hill-Communications/dp/0071477330Mobile Computing: Technology, Applications, and Service Creation”, Tata McGraw-Hill Communications Engineering, 2009
Web Sites/Links	<ol style="list-style-type: none"> 1. www.crcpress.com 2. www.mnprofessional.com 3. www.mobilecomputing.co.in 4. https://www.zebra.com/.../ 5. www.techspot.com 6. www.igi-global.com/book/

Content beyond the syllabus:

1. Applications using mobile computing.
2. Scope of CDPD system in mobile computing.
3. Perceptives of Fourth Generation Mobile Communication Systems.

Subject Title	Mobile& Pervasive Computing	Semester	III
Subject Code	14P3ITE08	Specialization	NA
Type	Elective	L:T:P:C	5:0:0:4
<u>Objectives</u>			
<ul style="list-style-type: none"> To present necessary concepts of Mobile Communication To analyze the strengths and limitations of the tools and devices for development of pervasive computing systems 			
Unit	Syllabus Contents	Number of Sessions	
I	Cellular Wireless Networks – GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security –GPRS	10	
II	Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services –Network – HiperLAN – Blue Tooth- Wi-Fi – WiMAX	10	
III	Mobile IP – DHCP – AdHoc– Proactive and Reactive Routing Protocols – Multicast Routing	09	
IV	Mobile TCP– WAP – Architecture – WWW Programming Model– WDP – WTLS – WTP – WSP – WAE – WTA Architecture – WML – WMLScripts	10	
V	Pervasive computing infrastructure-applications- Device Technology - Hardware, Human-machine Interfaces, Biometrics, and Operating systems– Device Connectivity – Protocols, Security, and Device Management- Pervasive Web Application architecture-Access from PCs and PDAs - Access via WAP	12	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. Jochen Schiller, “Mobile Communications”, PHI, Second Edition, 2003. 2. Jochen Burkhardt, Pervasive Computing: Technology and Architecture of Mobile Internet Applications, Addison-Wesley Professional; 3rd edition, 2007
Reference Books	<ol style="list-style-type: none"> 1. Frank Adelstein, Sandeep KS Gupta, Golden Richard, Fundamentals of Mobile and Pervasive Computing, McGraw-Hill 2005 2. Debashis Saha, Networking Infrastructure for Pervasive Computing: Enabling Technologies, Kluwer Academic Publisher, Springer; First edition, 2002 3. Introduction to Wireless and Mobile Systems by Agrawal and Zeng, Brooks/ Cole (Thomson Learning), First edition, 2002 4. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, Principles of Mobile Computing, Springer, New York, 2003
Web Sites/Links	<ol style="list-style-type: none"> 1. media.techtarget.com 2. www.sciencedirect.com 3. www.worldcat.org 4. www.cs.cmu.edu 5. www.rejinpaul.com

Content beyond the syllabus:

1. Scope of Mobile& Pervasive Computing
2. Application areas of pervasive computing.
3. Business trends and applications in pervasive computing.

Subject Title	Linux Programming	Semester	III
Subject Code	14P3ITE09	Specialization	NA
Type	Elective	L:T:P:C	5 : 0 : 0 : 4
<u>Objectives</u>			
<ul style="list-style-type: none"> To familiarize students with the Linux environment To learn the fundamentals of shell scripting/programming 			
Unit	Syllabus Contents	Number of Sessions	
I	Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.	12	
II	Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.	12	
III	Files: File Concept, File System Structure, I nodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.	12	
IV	Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs. Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.	12	
V	Interprocess Communication: Introduction to IPC, Pipes, and FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. Message Queues- Kernel support for messages, Unix system V APIs for messages, client/server example.	12	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. Unix System Programming using C++, T.Chan, PHI. 2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH. 3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
Reference Books	<ol style="list-style-type: none"> 1. Linux System Programming, Robert Love, O'Reilly, SPD. 2. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education. 3. Unix Network Programming ,W.R.Stevens,PHI.Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.
Web Sites/Links	<ol style="list-style-type: none"> 1. www.linuxlinks.com 2. linux.softpedia.com 3. www.techbooksforfree.com 4. www.linux.org 5. www.linux.com

Content beyond the syllabus:

1. Basic commands in LINUX and UNIX Programming.
2. Shell programming in OS.
3. Basics commands in shell programming.

Subject Title	Cloud Computing & Security	Semester	IV
Subject Code	14P4ITE10	Specialization	NA
Type	Elective	L:T:P:C	5 : 0 : 0: 4
<u>Objectives</u>			
To understand the emerging area of "cloud computing" and how it relates to traditional models of computing.			
Unit	Syllabus Contents	Number of Sessions	
I	Cloud computing: Introduction to Cloud Computing – history of cloud computing – client/server computing – peer-to-peer computing – distributed computing – collaboration computing – cloud computing – how cloud computing works: cloud storage – cloud architecture – cloud services – companies in the cloud – the pros and cons of cloud computing: advantages and disadvantages.	10	
II	Evolution of cloud computing-Web service delivered from the cloud - Developing cloud services-Building cloud networks - Virtualization	10	
III	Cloud Hardware and Infrastructure – Client – Security – Network – Services – Platforms. Cloud Solutions: introduction – Cloud Application Planning – Cloud Ecosystem – Cloud Business Process Management – Cloud Service Management: Key Cloud Solution Characteristics – on-premise Cloud Orchestration and Provisioning Engine – Computing On Demand (COD) – Cloud Sourcing.	10	
IV	Migrating to the Cloud: Cloud Services for individuals – Cloud Services Aimed at the Mid-Market – Enterprise-Class Cloud Offerings – Migration – Mobile Internet devices and the cloud - Best practices and the Future of Cloud Computing: Analyze your Service – Best Practices – How Cloud Computing Might Evolve.	10	
V	Security in cloud: Overview-Cloud Security Challenges- Software as a Service – Common standards in cloud computing - Symmetric ciphers: Classical encryption techniques – Data Encryption Standard – Advanced Encryption Standard – Multiple Encryption and Triple DES. Asymmetric ciphers: Public-key cryptography and RSA – Cryptographic hash function – Message authentication code.	10	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. Cloud Computing web – based applications at change the way you work & Collaborate online”, Michael miller,pearson. 2. ”Cloud Computing” 2nd edition, Dr.Kumarsaurabh,wiley India. 3. “Cryptography and Network Security” principles and practices – William Stallings. 5th Edition.
Reference Books	<ol style="list-style-type: none"> 1. ”Cloud Computing a practical approach”, McGraw Hills. 2. Cloud Computing Implementation , Management, & Security “John W. Rittinghouse, James F. Ransome “Special Indian Edition.
Web Sites / Links	<ol style="list-style-type: none"> 1. www.safecomputing.umich.edu 2. www.cloud-council.org 3. https://cloudsecurityalliance.org

Content beyond the syllabus:

1. Data storage security in cloud computing.
2. RSA data security in cloud computing.

Subject Title	Digital Image Processing	Semester	IV
Subject Code	14P4ITE11	Specialization	NA
Type	Elective	L:T:P:C	5 : 0 : 0 : 4
<u>Objectives</u>			
<ul style="list-style-type: none"> • To develop experience with using computers to process images. • To understand the basic principles and methods of digital image processing and able to formulate solutions to general image processing problems. 			
Unit	Syllabus Contents	Number of Sessions	
I	Introduction: What is Digital Image Processing? – Examples of Fields that Use Digital Image Processing – Fundamental Steps in Digital Image Processing – Components of an Image Processing System - Digital Image Fundamentals: Elements of Visual Perception – Light and Electro Magnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization – Some Basic Relationships between Pixels- Applications of Digital Image Processing	09	
II	Image Enhancement in the Spatial Domain: Background. Some Basic Gray Level Transformations - Histogram Processing- Enhancement Using Arithmetic/Logic Operations- Basics of Spatial Filtering- Smoothing Spatial Filters. Image Enhancement in the Frequency: Background - Introduction to the Fourier Transform and the Frequency Domain- Smoothing Frequency-Domain Filters- Sharpening Frequency Domain Filters- Homomorphic Filtering- Implementation- Difference between Image Processing and Signal Processing	10	
III	Image Restoration: A Model of the Image Degradation / Restoration Process- Noise Models- Restoration in the Presence of Noise Only–Spatial Filtering - Estimating the Degradation Function- Inverse Filtering- Minimum Mean Square Error (Wiener) Filtering. Color Image Processing: Color Fundamentals- Color Models- Pseudo color Image Processing- Basics of Full-Color Image Processing- Color Transformations- Smoothing and Sharpening- Image Segmentation Based on Color - Noise in Color Images- Color Image Compression.	11	
IV	Object Recognition: Knowledge Representation – Statistical Pattern Recognition – Neural Nets – Syntactic Pattern Recognition – Optimization Techniques - Fuzzy Systems – Mathematical Morphology – Basic Morphological Concepts – Binary Dilation and Erosion-Scope of Neural Networks in Digital Image processing	10	
V	Image Data Compression: Image Data Properties – Discrete Image Transforms in Image Data Compression – Predictive Compression Methods – Vector Quantization – Hierarchical and Progressive Compression Methods – Comparison of Compression Methods – Coding – JPEG and MPEG Image Compression – Texture.	10	

Learning Resources	
Text Books	<ol style="list-style-type: none"> 1. Rafael C. Gonzalez, Richard E. Woods, “Digital Image Processing”, Prentice Hall, Third Edition, 2008. (Unit I to III : Chapter-1,2,3,4,5&6) 2. Sonka, Hlavac, Boyle, “Digital Image Processing and Computer Vision”, Cengage Learning, Fourth Indian Reprint 2011. (Unit-IV:Chapters: 9&13,Unit-V:Chapters: 14&15)
Reference Books	<ol style="list-style-type: none"> 1. Anil.K.Jain, “Fundamentals of Digital Image Processing ”, Prentice Hall, 1989. 2. Chanda & Majumdar, “Digital Image Processing and Analysis”, Prentice Hall 3rd Edition.
Web Sites/Links	<ol style="list-style-type: none"> 1. www.nptel.ac.in 2. www.imageprocessingplace.com/ 3. www.slideshare.net/sahilbiswas/image-processing

Content beyond the syllabus:

1. Applications of digital image processing.
2. Difference between signal processing and image processing.
3. Scope of neural nets in digital image processing.

Subject Title	Enterprise Resource planning	Semester	IV
Subject Code	14P4ITE12	Specialization	NA
Type	Elective	L:T:P:C	5 : 0 : 0 : 4
Objectives			
To enable the students to learn the concepts of ERP, ERP package, SAP basics.			
Unit	Syllabus Contents	Number of Sessions	
I	Introduction: Enterprise An Overview-Introduction to ERP-Basic ERP concepts-Benefits of ERP.ERP and Technology: ERP and Related Technologies-Business Process Reengineering (BPR)-Data Warehousing,- Data Mining- LAP- SCM.	10	
II	ERP Implementation Lifecycle- Implementation Methodology: Hidden Costs-Organizing the Implementation-Vendors and Consultants-Contracts with Vendors-Consultants and Employees-Project Management and Monitoring – Agile Techniques Using Enterprise Software Implementation	10	
III	Business modules in an ERP Package-Finance- Manufacturing-Human Resources-Plant Maintenance-Materials Management-Quality Management-Sales and Distribution	12	
IV	ERP Market Place- SAP AG-People soft-Baan-JD Edwards- Oracle-QAD-SSA- ASAP Methodologies in ERP	11	
V	Turbo Charge the ERP System- EAI- ERP and E-business- ERP and Internet-Future Directions- ERP Softwares	09	

Learning Resources	
Text Books	1. Alexis Leon, “ERP Demystified”, Second Edition, Tata McGraw Hill, New Delhi, 2009.
Reference Books	<ol style="list-style-type: none"> 1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000. 2. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology, USA, 2001. 3. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003
Web Sites/Links	<ol style="list-style-type: none"> 1. http://www.webopedia.com/TERM/E/ERP.html. 2. https://erp.iitkgp.ernet.in/. 3. www.epicor.com/solutions/erp.aspx

Content beyond the syllabus:

1. ASAP methodologies in ERP.
2. Agile techniques using enterprise software implementation.
3. Different phase of ERP implementation.