P.G. DEPARTMENT OF COMPUTER SCIENCE (SF)

Nallamuthu Gounder Mahalingam College

(Autonomous)

(An ISO 9001:2008 Certified Institution)

Re-Accredited with 'A' Grade by NAAC

Pollachi-642001

SYLLABUS

M. Sc. COMPUTER SCIENCE (SF)

BATCH 2015-2017

S. No	Sem	Subject Code and Title		Hrs	Total Hrs	Credit points	University Examinations		
							Internal Max Marks	External Max Marks	Total Max Marks
		THEORY							
1	I	15PCS101	Object Oriented Software Engineering	5	75	5	25	75	100
2		15PCS102	Design And Analysis of Computer Algorithms	5	75	5	25	75	100
3		15PCS103	Data Mining and Warehousing	5	75	5	25	75	100
4		15PCS1E1	Elective-I Geographic Information and Global Positioning Systems	5	75	4	25	75	100
		PRACTICAL							
5		15PCS104	Programming Lab-I: UML	5	75	4	40	60	100
6		15PCS105	Programming Lab-II : Design And Analysis of Computer Algorithms	5	75	4	40	60	100
		THEORY							
7	II	15PCS206	Open Source And Computing Tools	4	60	4	25	75	100
8		15PCS207	Advanced Networks	5	75	4	25	75	100
9		15PCS208	Information Security	5	75	4	25	75	100
10		15PCS2E1	Elective-II Big Data Analytics	5	75	5	25	75	100
11		15PCS2N1/ 15PCS2N2	Non Major Elective I: Networking Technologies/ Client-Server Technologies	1	15	2	-	100	100
		PRACTICAL							
12		15PCS209	Programming Lab-III : Open Source And Computing Tools Lab	5	75	4	40	60	100
13		15PCS210	Programming Lab-IV : Networks	5	75	4	40	60	100

S. No	Sem	Subject Code and Title		Hrs	Total Hrs	Credit points	University Examinations		
							Internal Max Marks	External Max Marks	Total Max Marks
		THEORY							
14	III	15PCS311	J2EE Technologies	5	75	4	25	75	100
15		15PCS312	Digital Image Processing	5	75	4	25	75	100
16		15PCS313	Computing Technologies	4	60	3	25	75	100
17		15PCS3E1	Elective-III ERP and its applications	4	60	3	25	75	100
		PRACTICAL							
18		15PCS314	Programming Lab-V : J2EE Technologies	5	75	4	40	60	100
19		15PCS315	Programming Lab-VI: Digital Image Processing Lab	5	75	4	40	60	100
20		15PCS316	Pilot Project-I	-	-	6	40	60	100

S.No	Sem	Subject Code and Title		Credit points	University Examinations			
					Internal Max Marks	External Max Marks		Total Max Marks
						Project Evaluation	Viva-Voce	
		PROJECT						
21	IV	15PCS417	Industrial Project Work And Viva – Voce (Individual)	8	-	160	40	200
			TOTAL	90	-			2200

ELECTIVES LIST

S. No	Sem	Subject Code and Title		Hrs	Total Hrs	Credit points	University Examinations		
							Internal Max Marks	External Max Marks	Total Max Marks
		ELECTIVE I							
1	I	**15PCS1E1**	**Geographic Information And Global Positioning Systems**	5	75	4	25	75	100
2		15PCS1E2	Satellite Communication	5	75	4	25	75	100
3		15PCS1E3	Antennas And Propagation	5	75	4	25	75	100
4		15PCS1E4	Remote Sensing and Sensors	5	75	4	25	75	100
		ELECTIVE II							
5	II	**15PCS2E1**	**Big Data Analytics**	5	75	5	25	75	100
6		15PCS2E2	Embedded System	5	75	5	25	75	100
7		15PCS2E3	Machine Intelligence	5	75	5	25	75	100
8		15PCS2E4	Distributed Operating System	5	75	5	25	75	100
	III	**ELECTIVE III**							
9		**15PCS3E1**	**ERP and its Applications**	4	60	3	25	75	100
10		15PCS3E2	Managing Organization	4	60	3	25	75	100
11		15PCS3E3	Human Resource Management	4	60	3	25	75	100
12		15PCS3E4	Marketing Management	4	60	3	25	75	100

SEMESTER I

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS101	**Title:** Object Oriented Software Engineering	**Semester:** I
Hrs/Week:	5	**Credit:** 5
Objectives	On successful completion of the course the students should understand the concept of object oriented analysis and design has emerged as a new paradigm of analysis and design of the systems. This subject is designed to help in learning object oriented analysis and design concepts.	

UNITS	**Contents**	**Hrs**
Unit I	**Object Oriented Systems Development Life Cycle:** Introduction – The software development process – building high-quality software. **Object Oriented Methodologies:** Introduction: Toward Unification – Too many methodologies – Survey of some of the Object Oriented Methodologies – Rumbaugh Object Modeling Technique – The Booch Methodology – The Jacobson Methodologies.	**16**
Unit II	**UML diagrams:** Class diagrams – Object diagrams – Components – Use Cases – Activity Diagrams – State diagrams – Deployment – Collaborations – Deployment. Note: Concepts with examples only.	**16**
Unit III	The process-The software process-Software process models-The linear sequential model-The prototyping model-The RAD model-Evolutionary software process models-The formal methods model-Fourth generation techniques. Project management concepts- Software project planning.	**15**
Unit IV	Analysis modeling- Design concepts and principles- Design methods	**14**
Unit V	Software Testing-Types of testing-White box Testing-Black box Testing-Integration Testing-System and Acceptance testing-Performance Testing-Regression Testing.	**14**
Total Contact Hrs		**75**

Text Books:	1. Grady Booch , 2007 , "Object Oriented Analysis and Design", 3rd edition, Pearson 2. Grady Booch, James Raumbaugh and Ivar Jacobson, 2008, "The Unified Modeling Language User Guide" , 2nd Edition, Pearson 3. Roger S. Pressman , 1997, "Software Engineering", 4th Edition, McGraw-Hill 4. Srinivasan Desikan & Gopalaswamy Ramesh, "Software Testing- Principle and practices", 7th Edition
Reference Books:	1. Bernd Bruegge, Allen H. Dutoit, 2004, "Object Oriented Software Engineering using UML, Patterns and Java", 2nd Edition, Pearson 2. Craig Larman, 2002 , "Applying UML and Patterns", 2nd Edition, Pearson

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S.Sharmila		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS102	**Title:** Design And Analysis Of Computer Algorithms	**Semester:** I
Hrs/Week:	5	**Credit:** 5
Objectives	On successful completion of the course the students should understand the various design and analysis of the algorithms.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction:** algorithm definition and specification – performance analysis – Elementary Data structures:- stacks and queues – trees – dictionaries – priority queues – sets and disjoint set union – graphs – basic traversal and search techniques.	**16**
Unit II	**Divide – and – conquer:** - General method – binary search – merge sort – quick sort –The Greedy method:- General method – knapsack problem – minimum cost spanning tree –single source shortest path.	**15**
Unit III	**Dynamic Programming:** General method – multistage graphs – all pair shortest path –optimal binary search trees – 0/1 Knapsack – traveling salesman problem – flow shop scheduling.	**15**
Unit IV	**Backtracking:** General method – 8-Queens problem – sum of subsets – graph coloring –Hamiltonian cycles – knapsack problem.	**15**
Unit V	**Branch and bound:** The method – 0/1 Knapsack problem – traveling salesperson.	**14**
Total Contact Hrs		**75**

Text Books:	1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, 2008, "Computer Algorithms", 2nd Edition, Galgotia Publications
Reference Books:	1. Ellis Horrowitz, Sartaj Sahni, 2008, "Fundamentals of data structures", Reprinted Edition, Galgotia Publications 2. Alfred V.Aho, John E.Hopcroft & Jeffery D Ullman, 2009 , "Data structures and Algorithms", Reprinted Edition, PHI learning pvt Ltd 3. Adam Drozdek, 2001, "Data Structures and Algorithms in C++", 4th Edition, Vikas publishing house, NewDelhi

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T.Menaka		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS103	**Title:** Data Mining And Warehousing	**Semester:** I
Hrs/Week:	5	**Credit:** 5
Objectives	On Successful completion of the course the students should understand the Association rules, Clustering techniques and Data warehousing.	

UNITS	**Contents**	**Hrs**
Unit I	**Basic data mining tasks:** Data Mining versus Knowledge discovery in databases – data mining issues – data mining metrics – social implications of data mining – data mining from a database perspective. **Data mining techniques:** Introduction – a statistical perspective on data mining– similarity measures–decision trees–neural networks–genetic algorithms.	**15**
Unit II	**Classification:** Introduction – Statistical – based algorithms - distance – based algorithms – decision tree - based algorithms - neural network – based algorithms – rule – based algorithms – combining techniques.	**16**
Unit III	**Clustering:** Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms. **Association rules:** Introduction - large item sets - basic algorithms – parallel & distributed algorithms – comparing approaches- incremental rules – advanced association rules techniques – measuring the quality of rules.	**14**
Unit IV	**Data warehousing:** An introduction - characteristics of a data warehouse – data marts – other aspects of data mart. **Online analytical processing:** Introduction - OLTP & OLAP systems– data modeling – star schema for multidimensional view – data modeling – multifact star schema or snow flake schema–OLAPTOOLS–State of the market – OLAP TOOLS and the internet.	**15**
Unit V	**Developing a Data Warehouse:** why and how to build a data warehouse –data warehouse architectural strategies and organization issues - design consideration – data content – metadata distribution of data – tools for data warehousing – performance considerations –crucial decisions in designing a data warehouse. Applications of data warehousing and data mining in government: Introduction - national data warehouses – other areas for data warehousing and data mining.	**15**
Total Contact Hrs		**75**

Text Books:	1. Margaret H. Dunham, 2008, "Data mining introductory and advanced topics", 3rd Edition, Pearson education 2. Prabhu C.S.R, 2000, "Data warehousing concepts, techniques, products and a applications", 2nd Edition, PHI
Reference Books:	1. Jiawei Han & Micheline Kamber, 2001, " Data mining Concepts & Techniques", 2nd Edition, Academic Press **2.** Arun K.Pujari, 2003, "Data Mining Techniques", Revised Edition, Universities Press (India) Pvt. Ltd.,

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N.Yasodha		M.Sakthi		

ELECTIVE I

S.No	SUBJECT CODE	TITLE
1	**15PCS1E1**	**GEOGRAPHIC INFORMATION AND GLOBAL POSITIONING SYSTEMS**
2	15PCS1E2	SATELLITE COMMUNICATION
3	15PCS1E3	ANTENNAS AND PROPAGATION
4	15PCS1E4	REMOTE SENSING AND SENSORS

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS1E1	**Title: ELECTIVE- I** Geographic Information and Global Positioning Systems	**Semester:** I
Hrs/Week:	5	**Credit:** 4
Objectives	On successful completion of the course the students should understand the concepts of data model, geographic information system and concepts project management.	

UNITS	**Contents**	**Hrs**
Unit I	**Fundamentals of GIS:** Introduction – Defining GIS – Components of GIS. **Spatial Data**: Maps and their influences in the character of spatial data – Thematic characteristics of spatial data – Other sources of spatial data.	**14**
Unit II	**Spatial Data Modeling**: Entity Definition – Spatial data models – Spatial data structures – Modeling Surfaces – Modeling networks – Building computer worlds – Modeling third and fourth dimension. **Database Management:** Why choose a database approach – Database data models – Creating a database – GIS database applications – Developments in databases.	**14**
Unit III	**Data Input and Editing:** Methods of Data input – Data Editing – Towards an Integrated Databases. **Data Analysis:** Measurements in GIS – Queries – Reclassification – Buffering and Neighborhood functions – Integrating data- map overlay – Spatial Interpolation – Analysis of surfaces – Network analysis.	**16**
Unit IV	**Issues in GIS:** Data quality issues - Describing data quality and errors – Sources of errors in GIS – Finding and modeling errors in GIS – Managing GIS error - Human and organizational issues: GIS Applications – GIS Users – Justifying the investment in GIS – Choosing and Implementing a GIS – Organizational changes due to GIS - Future of GIS.	**15**
Unit V	**Global Positioning Systems:** Introduction to GPS - Accuracy of GPS - Various Satellites used by GPS - Differential GPS - Fundamentals of GPS - Applications of GPS - GPS Receivers – Hand held GPS Receiver - Integration of GIS and GPS.	**16**
Total Contact Hrs		**75**

Text Books:	1. Heywood, Cornelius, Carver, 2002, "An Introduction to Geographical Information Systems", 3rd Edition, Pearson Education 2. Rao.G. S, 2010, "Global Navigation Satellite Systems", McGraw Hill Publications
Reference Books:	1. Lo. C. P and Albert Yeung, 2000, "Concepts and techniques of Geographic Information Systems", PHI, New Delhi 2. Michael N. Demers, 2001, "Fundamentals of Geographic information Systems", 2nd Edition, John Wiley & Sons (ASIA) Pvt Ltd., 3. Razvi , 2002, "ArcGIS Developer's Guide for Visual Basic Applications", Onword Press

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M.Dhavapriya		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS1E2	**Title:** Satellite Communication	**Semester:** I
Hrs/Week:	5	**Credit:** 4
Objectives	On successful completion of the course the students should understand the concepts of satellites and satellite services.	

UNITS	**Contents**	**Hrs**
Unit I	**Satellite Orbits :** Kepler's Laws, Newton's law, orbital parameters, orbital perturbations, station keeping, geo stationary and non Geo-stationary orbits – Look Angle Determination- Limits of visibility –eclipse-Sub satellite point –Sun transit outage-Launching Procedures -launch vehicles and propulsion.	**13**
Unit II	**Space Segment And Satellite Link Design:** Spacecraft Technology- Structure, Primary power, Attitude and Orbit control, Thermal control and Propulsion, communication Payload and supporting subsystems, Telemetry, Tracking and command. Satellite uplink and downlink Analysis and Design, link budget, E/N calculation- performance impairments-system noise, inter modulation and interference, Propagation Characteristics and Frequency considerations- System reliability and design lifetime.	**15**
Unit III	**Satellite Access:** Modulation and Multiplexing: Voice, Data, Video, Analog – digital transmission system, Digital video Brocast, multiple access: FDMA, TDMA, CDMA, Assignment Methods, Spread Spectrum communication, compression – encryption.	**15**
Unit IV	**Earth Segment:** Earth Station Technology-- Terrestrial Interface, Transmitter and Receiver, Antenna Systems TVRO, MATV, CATV, Test Equipment Measurements on G/T, C/No, EIRP, Antenna Gain.	**16**
Unit V	**Satellite Applications:** INTELSAT Series, INSAT, VSAT, Mobile satellite services: GSM, GPS, INMARSAT, LEO, MEO, Satellite Navigational System. Direct Broadcast satellites (DBS)- Direct to home Broadcast (DTH), Digital audio broadcast (DAB)- Worldspace services, Business TV(BTV), GRAMSAT, Specialized services – E –mail, Video conferencing, Internet.	**16**
Total Contact Hrs		**75**

Text Books:	1. Dennis Roddy, 'Satellite Communication', McGraw Hill International, 4th Edition, 2006 2. Wilbur L. Pritchard, Hendri G. Suyderhoud, Robert A. Nelson, 'Satellite Communication Systems Engineering', Prentice Hall/Pearson, 2007
Reference Books:	1. N.Agarwal, 'Design of Geosynchronous Space Craft, Prentice Hall, 1986 2. Bruce R. Elbert, 'The Satellite Communication Applications' Hand Book, Artech HouseBostan London, 1997 3. Tri T. Ha, 'Digital Satellite Communication', II edition, 1990

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S.Sharmila		M.Sakthi		

Department	**Computer Science**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS1E3	**Title:** Antennas And Propagation	**Semester:** I	
Hrs/Week:	5	**Credit:** 5	
Objectives	On successful completion of the course the students should understand the concepts of Antennas and its propagation.		
UNITS	**Contents**		**Hrs**
Unit I	**Antenna Basics:** Introduction, basic Antenna parameters, patterns, beam area, radiation intensity, beam efficiency, diversity and gain, antenna apertures, effective height, bandwidth, radiation, efficiency, antenna temperature and antenna filed zones.		**14**
Unit II	**Point Sources And Arrays:** Introduction, point sources, power patterns, power theorem, radiation intensity, filed patterns, phase patterns. Array of two isotropic point sources, non-isotropic but similar point sources, principles of pattern multiplication, examples of pattern synthesis by pattern multiplication, non-isotropic point sources, broad side array with non unipolar amplitude distribution, broad side versus end fire array, direction of maxima fire arrays of n isotropic point sources of equal amplitude and spacing.		**15**
Unit III	**Electric Dipoles And Thin Linear Antennas:** Introduction, short electric dipole, fields of a short dipole, radiation resistance of short dipole, radiation resistances of lambda/2 Antenna, thin linear antenna, micro strip arrays, low side lobe arrays, long wire antenna, folded dipole antennas.		**14**
Unit IV	**Loop, Slot, Patch And Horn Antenna:** Introduction, small loop, comparison of far fields of small loop and short dipole, loop antenna general case, far field patterns of circular loop, radiation resistance, directivity, slot antenna, Balinet's principle and complementary antennas, impedance of complementary and slot antennas, patch antennas, horn antennas, rectangular horn antennas.		**16**
Unit V	**Antenna Types:** Helical Antenna, Yagi-Uda array, corner reflectors, parabolic reflectors, log periodic antenna, lens antenna, antenna for special applications – sleeve antenna, turnstile antenna, omni directional antennas, antennas for satellite antennas for ground penetrating radars, embedded antennas, ultra wide band antennas, plasma antenna.		**16**
Total Contact Hrs			**75**
Text Books:	1. Harish and Sachidananda, 2007, "Antennas and Wave Propagation" Oxford Press		
Reference Books:	1. Balanis.C.A,1997, "Antenna Theory Analysis and Design", 2nd Edition, John Wiley 2. Sineon. R.Saunders, 2003, "Antennas and Propagation for Wireless Communication Systems", John Wiley		

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Department	**Computer Science**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS1E4	**Title:** Remote Sensing And Sensors	**Semester:** I	
Hrs/Week:	5	**Credit:** 5	
Objectives	On successful completion of the course the students should understand the concepts of remote sensing and sensors.		
UNITS	**Contents**		**Hrs**
Unit I	**Basics of Remote Sensing:** Principles of Remote sensing, History of Remote sensing, Remote sensing in India, Electromagnetic Radiation and Electromagnetic Spectrum. **EMR quantities:** Nomenclature and Units, Thermal Emission of Radiation, Radiation Principles (Plank's Law, Stephen Boltezman law), Interaction of EMR with the Earth Surface (Wien's displacement law, Kirchoffs Law), Spectral signature, Reflectance characteristics of Earths cover types, Remote sensing systems.		**15**
Unit II	**Platforms and sensors:** Platforms, Remote sensing sensors, resolutions Across track and along the track scanning, Optical sensors, Thermal scanners, Microwave sensing radar, satellite missions, Landsat series, SPOT series, IRS satellite series, IKNOS.		**14**
Unit III	**Microwave Remote Sensing:** Airborne and Space borne radar systems basic instrumentation. System parameters - Wave length, Polarization, Resolutions, Radar geometry, Target parameters - Back scattering, Point target, Volume scattering, Penetration, Reflection, Bragg resonance, Cross swath variation. Speckie radiometric calibration: Radar - Grametry - Introduction, Mosaicing Stereoscope. **Application:** Geology, Forestry, Land use, Soils etc. Future trends and Research.		**15**
Unit IV	**Thermal Imaging system:** Introduction - IR region of the Electromagnetic spectrum, Atmospheric transmission, Kinetic and radiant temperature, Thermal properties of materials, Emissivity, Radiant temperature. Thermal conductivity. Thermal capacity, thermal inertia, Apparent thermal inertia, Thermal diffusivity. IR - radiometers, Airborne and Satellite TTR scanner system, Characteristics of IR images i) Scanner distortion, ii) image irregularities, iii) Film density and recorded iv)Temperature ranges **Effects of weather on images:** i) Clouds, ii) Surface winds, iii) Penetration of smoke plumes, • Interpretation of thermal imagery, • Advantages of Thermal imagery.		**16**
Unit V	**Meteorological satellites:** Meteorological satellite characteristics and their orbits, TIROS, NIMBUS, NOAA, TIROS N, SEASAT, GOES, METEOSAT, INSAT, Measurement of Earth and Atmospheric energy and Radiation budget parameters from satellites		**15**
Total Contact Hrs			**75**

Text Books:	1. Travelt.W, "Imaging Radar for Resource Survey: Remote Sensing Applications", 3rd Edition, Chapman & Hall 2. Davis.S.M, Swain.P.H, "Remote Sensing: The quantitative approach", McGraw Hill
Reference Books:	1. Barrett. E.C, Curtis.L.F, " Introduction to Environmental Remote Sensing", Chapman and Hall, London 2. Floyd, F. Sabins, 1978 , "Remote Sensing Principles and Interpretation", Freeman and Co., San Franscisco

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Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS104	**Title:** Programming Lab-I: UML	**Semester:** I
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should understand the concepts of UML Diagrams.	

Create a UML diagrams for the following applications.

- Single sign-on to Google Application
- Banking system
- ATM Processing System
- Quiz system
- Student information system
- Gas agency
- Tourism and travel management system
- Online shopping Domain
- Construction management system
- Library domain model
- Inventory management system
- payroll processing system
- Hotel management system
- Ration shop management system
- Real estate

Note: The applications are developed using Class, Object, Use case, Sequence, Activity, Collaboration, Deployment, Component diagrams.

Total Contact Hrs	**75**

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S.Sharmila		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS105	**Title:** Programming Lab-II: Design And Analysis of Computer Algorithm	**Semester:** I
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should understand the concepts of data structures.	

Program to implement the concept for

- Permutation Generator
- Towers of Hanoi
- Circular Queue
- Stack using Linked list
- Doubly linked list
- Tree traversal(inorder, preorder, postorder)
- Graph traversal Using Depth first search
- Graph traversal Using Breadth first search
- Binary search
- Merge sort using divide and conquer
- Quick sort
- Insertion of element into heap
- Implementation of 8-Queens problem
- Traveling sales man problem
- Knapsack using Greedy Method
- Minimum Cost Spanning tree
- Optimal Binary Search
- 0/1 Knapsack problem using dynamic programming
- All pairs shortest path
- Flow shop scheduling.
- Knapsack problem using backtracking

Total Contact Hrs	**75**

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SEMESTER II

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS206	**Title:** Open Source And Computing Tools	**Semester:** II
Hrs/Week:	4	**Credit:** 4
Objectives	On Successful completion of the course the students should have gained knowledge in PHP Programming and Linux.	

UNITS	**Contents**	**Hrs**
Unit I	**DOTNET Framework** -Introduction to DOTNET- DOT NET class framework- Common Language Runtime- Overview- Elements of .NET application - Memory Management- Garbage Collector : Faster Memory allocation ,Optimizations- Common Language Integration- Common type system Reflection API- User and Program Interface VB.NET: Control flow – conditional statements-Loops-methods**.**	**12**
Unit II	**ASP.NET Controls:** Overview of dynamic web page, introduction & features of ASP.NET, understanding ASP.NET controls, applications. Web forms, web form controls, server controls, client controls, adding controls to web form, buttons, text box, labels, checkbox, radio buttons, list box. Adding controls a runtime, Running a web application, creating a multiform web project, Form validation: client side and server side validation, Validation controls: required field comparison range, Calendar control, Ad rotator control.	**12**
Unit III	**Open source:** Introduction - Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Where I can use Linux? Linux Kernel – Linux Distributions - Linux Essential Commands – File system Concept - Standard Files - The Linux Security Model - Vi Editor - Partitions creation - Shell Introduction - String Processing - Investigating and Managing Processes - Network Clients - Installing Application.	**11**
Unit IV	**Apache:** Introduction - Apache Explained - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Consider Allowing Access to Local Documentation - Don't Allow public_html Web sites - Apache control with .htaccess **MySQL:** Introduction to MY SQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.	**13**
Unit V	**PHP:** PHP Introduction- General Syntactic Characteristics - PHP Scripting - Commenting your code - Primitives, Operations and Expressions - PHP Variables - Operations and Expressions Control Statement - Array - Functions - Basic Form Processing - File and Folder Access - Cookies - Sessions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.	**12**
Total Contact Hrs		**60**

Text Books:	1. Jeffrey R. Shapiro, 2002, "VB.NET Complete Reference", Tata McGraw-Hill Publication Edition 2. Dave Mercer, 2002, "ASP.NET: A Beginner's Guide", Tata McGraw-Hill Publication Company Limited 3. James Lee and Brent Ware, 2008, "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", Dorling Kindersley(India) Pvt. Ltd.,
Reference Books:	1. Eric Rosebrock, Eric Filson, 2004, "Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Published by John Wiley and Sons

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R.Nandhakumar		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS207	**Title:** Advanced Networks	**Semester:** II
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should gain in-depth knowledge of Internet protocols and their functionalities.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction and overview:** The Motivation For Internetworking-The TCP/IP Internet-Internet Services-History and scope of the Internet-The Internet Architecture Board-The IAB Reorganization. Review Of Underlying Network Technologies: Two Approaches To network Communication-Wide Area And Local Area Networks-Ethernet Technology-Switched Ethernet-Asynchronous Transfer Mode. Internetworking Concept And Architectural Model-Classful Internet Addresses-Mapping **Internet Addresses To Physical Addresses(ARP):** The Address Resolution Problem-Two Types Of Physical Addresses-Resolution Through Direct Mapping-Resolution Through Dynamic Binding-The Address Resolution Cache-ARP Cache Timeout-ARP Refinements-Relationship Of ARP To Other Protocols-ARP Implementation-ARP Encapsulation And Identification-ARP Protocol Format-Automatic ARP Cache Revalidation-Reverse Address Resolution(RARP).	**14**
Unit II	**Internet Protocol:** Connectionless Datagram Delivery (IPv4): A Virtual Network-Internet Architecture and Philosophy-The Conceptual Service Organization-Connectionless Delivery System-Purpose of the Internet Protocol-The IPv4 Datagram-Internet Datagram Options. **Internet Protocol:** Forwarding IP Datagrams: Forwarding In An Internet-Direct And Indirect Delivery-Table-Driven IP Forwarding-Next-Hop Forwarding- The IP Forwarding Algorithm-Forwarding With IP Addresses-Internet Protocol-Error And Control Messages(ICMP): The Internet Control Message Protocol-Error Reporting Vs. Error Correction-ICMP Message Delivery-ICMP Message Format-Testing Destination Reachability And Status(ping)-Echo Request And Reply Message Format-Reports Of Unreachable Destinations-Congestion And Datagram Flow Control-Source Quench Format.	**15**
Unit III	**Classless And Subnet Address Extensions(CIDR):** Review Of Relevant Facts-Minimizing Network Numbers-Proxy ARP-Subnet Addressing-Flexibility In Subnet Address Assignment -The Subnet Forwarding Algorithm-A Unified Forwarding Algorithm. **Protocol Layering:** Introduction –Needs-Conceptual Layer_ Functionality-X.25 and ISO Model-Locus of intelligence-Principle-Network substructure-TCP/IP Model-Disadvantage-Idea behind Multiplexing and Demultiplexing. User Datagram Protocol(UDP): Identifying The Ultimate Destination-The User Datagram Protocol-Format Of UDP Messages-UDP Pseudo-Header-UDP Encapsulation And Protocol Layering-Layering And The UDP Checksum Computation-UDP Multiplexing, Demultilplexing , And Ports-Reserved And Available UDP Port Numbers.	**14**

Unit IV	**Routing Between Peers(BGP):** BGP Characteristics-BGP Functionality And Message Types-BGP Message Header-BGP OPEN Message-BGP UPDATE Message-Compressed Mask-Address pairs-BGP path Attributes-BGP KEEPALIVE Message-The Internet Routing Architecture-BGP NOTIFICATION Message. **Mobile IP:** Mobility, Routing, and Addressing-Mobile IP Characteristics- The Two-Crossing Problem-Communication With Computers On The Home Network-Client-Server Model Of Interaction. **Bootstrap and Auto-configuration (DHCP):** IP address-retransmission-Message format-Address Acquisition States.	**17**
Unit V	**Remote Login And Desktop (TELNET, SSH):** Remote Interactive Computing-TELNET Protocol-Accommodating Heterogeneity-Passing Commands That Control The Remote Side-Forcing The Server To Read A Control Function-TELNET Options-TELNET Option Negotiation-Secure Shell (SSH)-Other Remote Access Technologies. File Transfer And Access(FTP, TFTP, NFS)-Electronic mail(SMTP, POP, IMAP, MIME)-World Wide Web (HTTP)-Network Management(SNMP)-A Next Generation IP(IPv6).	**15**
Total Contact Hrs		**75**
Text Books:	1. Douglas E. Comer, 2010, "Internetworking with TCP/IP Volume I", Prentice Hall.	
Reference Books:	1. Douglas E. Comer, David L. Stevens, 2010, "Internetworking with TCP/IP Volume II", Prentice Hall. 2. Uyless Black, 2005, "TCP/IP & Related Protocols", Tata McGraw-Hill. Menezes.A, Van Oorschot.P and Vanstone. S, 2011, "Hand Book of Applied Cryptography", CRC Press.	

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Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS208	**Title:** Information Security	**Semester:** II
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should understand the Technology infrastructure, Electronic commerce software and Business strategies and understand the fundamentals of security and how it attacks.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction to Electronic Commerce:** Electronic Commerce– Business Models, Revenue Models, and Business Processes – Economic Forces and Electronic Commerce – Identifying Electronic Commerce Opportunities – International Nature of Electronic Commerce. **Technology Infrastructure**: The Internet and the Word Wide Web– Internet and World Wide Web – Packet – Switched Networks – Internet Protocols – Markup Languages and the Web – Intranets and Extranets – Internet Connection Options - Internet2 and The Semantic Web.	**15**
Unit II	**E-Marketing:** Online Marketing – E-Advertising-E-branding-**E-Security:** information system security-security on the internet – **E-Payment Systems:** Digital token based e-payment systems- classification of new payment systems-check payment systems on the internet. **E-Customer Relationship Management:** customer relationship management-typical business touch points. **E-Supply Chain Management:** smart chains-smarter gains-E-supply chain components-e-supply chain architecture.	**17**
Unit III	**E-Strategy:** Changes in technology-definitions of knowledge-importance of knowledge management-stages-seven dimensions-value chain and e-strategy **Mobile Commerce:** Technologies for Mobile Commerce– WAP Programming Model – Wireless Technologies – Different Generations in Wireless Communication – Security issues Pertaining to Cellular Technology –M-Commerce in India.	**15**
Unit IV	**Network security:** authentication applications: Kerberos –x.509 authentication service- **E-mail Security:** Pretty Good Privacy, S/MIME (Secure/Multipurpose Mail Extension). IP security.	**14**
Unit V	**System & Web Security:** Malicious Software: Viruses and Related threats, Virus counter measures, distributed Denial of service attacks. Firewalls: Firewall, Firewall Design Principles, Trusted Systems. **Web Security:** Web Security Considerations, Secure socket layers, Transport Layer Security-Secure Electronic Transaction.	**14**
Total Contact Hrs		**75**

Text Books:	1.Gary P. Schneider, 2012, "E-Commerce Strategy, Technology and Implementation", 9th Edition, CENGAGE Learning India Private Limited (Unit I) 2.P.T. JOSEPH, 2013, "E-Commerce an Indian Perspective", Fourth Edition, Prentice Hall of India (Unit II & Unit III) 3.William Stalling, 2006, "Cryptography and Network Security Principle and Practice", 4rd Edition, Pearson Publications (Unit IV&V)
Reference Books:	1. Mike Papazologn, 2008, "E-Business, Organizational and Technical Foundations", Wiley India Pvt Ltd., 2. Elias M. Awad, 2008, "Electronic Commerce", Prentice-Hall of India 3. Panko Stalling , 2000, "Cryptography and Network Security Principle and Practice", 3rd Edition 4. Bruce Schneir, 2000, "Applied Cryptography", CRC Press

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ELECTIVE II

S.No	SUBJECT CODE	TITLE
1	**15PCS2E1**	**BIG DATA ANALYTICS**
2	15PCS2E2	EMBEDDED SYSTEM
3	15PCS2E3	MACHINE INTELLIGENCE
4	15PCS2E4	DISTRIBUTED OPERATING SYSTEM

Department	**Computer Science**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS2E1	**Title: ELECTIVE-II** Big Data Analytics	**Semester:** II	
Hrs/Week:	5	**Credit:** 5	
Objectives	On Successful completion of the course students should understand about big data, its architecture, the concept of Hadoop and Map reduce functions and the integration with data warehouse.		
UNITS	**Contents**		**Hrs**
Unit I	**Fundamentals of Big Data:** Evolution of Data Management-Managing the data – Big Data – Big data management architecture. **Big Data Types**: Structured data – Unstructured Data –Real Time and Non-real time requirements – Big Data together. **Distributed Computing:** History of Distributed Computing – Basics of Distributing Computing – Performance.		**14**
Unit II	**Big Data Technology Components**: Big Data Stack – Redundant Physical Infrastructure – Security Infrastructure – Operational Databases – Organizing Data Services and Tools – Analytical Data Warehouses – Big Data Analytics – Big Data Applications. **Virtualization:** Basics of Virtualization – Managing virtualization with Hypervisor – Abstraction and Virtualization – Implementing Virtualization. **Cloud and Big Data:** Cloud in the context of Big Data – Cloud Deployment and Delivery models – Cloud as an imperative for big data – Use of cloud for Big data – Providers in the Big Data Cloud Market.		**14**
Unit III	**Operational Database:** Relational, Non-relational, Key-value Pair, Document, Columnar, Graph, Spatial, Polygot Persistence. **Map Reduce Fundamentals**: Origin of Map Reduce- Map Function – Reduce Function – Putting Map and Reduce together – Optimizing Map-ReduceTasks. **Exploring the world of Hadoop**: Hadoop – Hadoop Distributed File System – Hadoop map Reduce. **Hadoop Foundation and Ecosystem**: Building Big Data Foundations with Hadoop Ecosystems – Managing Resources and Applications with Hadoop YARN – Storing Big Data with HBase – Mining Big Data with Hive – Interacting with Hadoop Ecosystem.		**16**
Unit IV	**Appliances and Big Data Warehouse**: Integrating Big Data with Traditional Data Warehouse – Big Data Analysis and Data Datawarehouse – Changing the role of Data Warehouse – Changing Deployment Models to the Big Data Era – Future of Data Warehouse. **Defining Big Data Analytics:** Using Big Data to get results – Modifying BI products to handle Big Data – Big Data Analytics Examples. **Integrating Data Sources**: Identifying the data – Fundamentals of Big Data Integration – Defining Traditional ETL – Understanding ELT – Prioritizing Big Data Quality – Using Hadoop as ETL – Best practices for Data Integeration in a Big Data World.		**15**
Unit V	**Importance of Big Data to business:** Big Data as a Business planning Tool-Adding new Dimensions to the planning cycle – Keeping data analytics in perspective – Getting Started with the right Foundation – Getting the Big data Strategy started- Planning for Big Data – Transforming Business Processes with Big Data. Ten Big Data Best Practices – Ten Big Data Resources – Ten Big data do's and don'ts.		**16**

Total Contact Hrs	**75**
Text Books:	1. Judith Hurwitz, Alan Nurgent, Dr. Fern Halper, Marcia Kaufman, 2013, " Big Data for Dummies", First Edition, A Wiley Publication
Reference Books:	1. Michael Minelli, Michele Chambers, Ambiga Dhiraj, 2013, "Big Data, Big Analytics – Emerging Business Intelligence and Analytic Trends For Todays Businesses", First Edition, A Wiley Publication 2. Strata Conference, Making Data Work, 2013, "Big Data Now", First Edition, Shroff Publication

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M.Dhavapriya		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS2E2	**Title:** Embedded Systems	**Semester:** II
Hrs/Week:	5	**Credit:** 5
Objectives	On successful completion of the course the students should understand the different types Embedded systems processors and its solutions in programming concepts using C and C++.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction:** Introduction to Embedded systems, processor in the system, Other hardware units, Software Embedded into a system, Exemplary Embedded Systems, Embedded System-On-Chip(SOC) and in VLSI Circuit. **Processor and Memory Organization:** Structural units in processor, Memory Devices, Memory selection for Embedded system, Allocation of memory to program segments and blocks and memory map of a system, Direct memory access.	**14**
Unit II	**Devices and Buses for Device Networks:** I/O Devices, Device drivers, Parallel port device drivers in a system, Serial port device drivers in a system, Devices drivers for internal programmable timing devices, Interrupt servicing mechanism, Context and periods for context switching, Deadline and interrupt latency.	**14**
Unit III	**Programming concepts and embedded programming in C and C++:** Software programming in assembly language and in high level language, 'C' program elements :header and source files and preprocessor directives, program elements: macros and functions, program elements : data types, data structures, modifiers, statement, loops and pointers, queues, stacks, list and ordered lists, embedded programming in C++,embedded programming in java, 'c' program compiler and cross-compiler, source code engineering tools for embedded C/C++, optimisation of memory needs.	**16**
Unit IV	**Program modeling concepts in single and multiprocessor systems software-development process:** modeling processes for software analysis before software implementation, programming models for event controlled or response time constrained real time programs, modeling of multiprocessor systems. software engineering practices in the embedded software development process: software algorithm complexity, software development process life cycle and its models, software analysis, software design, software implementation, software testing, validating and debugging, real time programming issues and during the software development process, software project management, software maintenance.	**15**
Unit V	**Inter-process communication and synchronization of processes, tasks and threads:** multiple processes in an application, problem of sharing data by multiple tasks and routines, inter process communication. **Real Time Operating Systems:** operating system services, I/O subsystem, network operating systems, real-time and embedded system operating systems, interrupt routines in RTOS environment: handling of interrupt source call by the RTOS,RTOS task scheduling models, interrupt latency and response times of the tasks as performances matrices.	**16**
Total Contact Hrs		**75**

Text Books:	1. Raj Kamal, 2008, "Embedded Systems", "Architecture, programming and design", International Editions, Tata McGraw-Hill
Reference Books:	1. Steve Heath, Elsevier, 2003, "Embedded Systems Design", 2nd Edition, Elsevier India Pvt Ltd., 2. Qing Li & carotene Yao, 2006, "Real Time Concepts for Embedded System", CMP books, New York

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M.Meena Krithika		M.Sakthi		

Department	**Computer Science**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS2E3	**Title:** Machine Intelligence	**Semester:** II	
Hrs/Week:	5	**Credit:** 5	
Objectives	On successful completion of the course the students should have to understood the different types of Intelligence problems and its solutions.		
UNITS	**Contents**		**Hrs**
Unit I	**Introduction:** What is AI?-History of AI?-Intelligent Agents- Agents and Environment-Good Behavior: Concept of Rationality-The nature of Environments- the Structure of Agents. Solving problems by searching-Example problems-searching for solutions-Uninformed search strategies-Searching with partial Information.		**14**
Unit II	**Informed search and exploration:** Informed search strategies-Heuristic functions-Local search algorithms and optimization problems-local search in continuous spaces-Constraint satisfaction problems-backtracking search for CSPs-local search for constraint satisfaction problems-The structure of problems-Adversarial search-games-optimal decisions in games-Alpha beta pruning-Imperfect, real-time Decisions.		**14**
Unit III	**Knowledge Representation:** first order logic (FOL) –Syntax and semantics of FOL – Using FOL- Knowledge Engineering in FOL-Inference in FOL-Propositional Vs first order inference- Unification and Lifting-Forward chaining-backward chaining-categories and objects-actions –situations-Events.		**16**
Unit IV	**Learning:** Learning from Observations-forms of learning-Inductive learning-learning decision trees-Ensemble Learning-Knowledge in learning-Logical formulation of learning –knowledge in learning-Explanation based learning-learning using relevance information- Inductive logical programming.		**15**
Unit V	**Communication:** Communication as action –A formal grammar for fragment of English-Syntactic Analysis-Augmented Grammars-Semantic Interpretation-Ambiguity and disambiguation –discourse understanding-Grammar Induction.		**16**
Total Contact Hrs			**75**
Text Books:	1. Stuart Russel, Peter Norwig, 2002, "Artificial Intelligence – A modern approach", 2nd Edition, Pearson Education		
Reference Books:	1. Elaine Rich, Kevin Knight, 2003, "Artificial Intelligence", 2nd Edition, Tata McGrawHill 2. Paterson.D.W., 1990, "Introduction To Artificial Intelligence And Expert Systems", 2nd Edition, Prentice Hall Of India		

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M.Dhavapriya		M.Sakthi		

Department	**Computer Science**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS2E4	**Title:** Distributed Operating System	**Semester:** II	
Hrs/Week:	5	**Credit:** 5	
Objectives	On successful completion of the course the students should understand the concepts of Operating System, understood the Inter-process communication, understood the concepts distributed Operating System.		
UNITS	**Contents**		**Hrs**
Unit I	**Distributed Computer Operating System Fundamentals:** What is a Distributed Computing System-Evolution of Distributed Computing Systems-Distributed Commuting System Models-Why are Distributed Computing System Gaining Popularity - What is a Distributed Operating System - Introduction to DCE-Creation-Components-Cells. **Network types:** LAN Technologies- WAN Technologies- Communication protocols-Internetworking.		**16**
Unit II	**Message Passing:** Introduction- Desirable Features of a Good Message Passing system-Issues in IPC by message passing- Synchronization-Buffering- Multidatagram Messages - Encoding and Decoding of Message Data- Process Addressing- Failure Handling- Group Communication.		**15**
Unit III	**Remote Procedure Calls:** Introduction- The RPC Model- Transparency of RPC- Implementing RPC Mechanism- Stub Generation- RPC Messages-Marshaling Arguments and Results- Server Management- Parameter-Passing Semantics- Call Semantics- Communication Protocols for RPCs- Complicated RPCs-Client-Server Binding. **Distributed Shared Memory:** Introduction- General Architecture of DSM System- Design and Implementation Issues of DSM- Granularity- Structure of Shared Memory Space- Replacement Strategy.		**15**
Unit IV	**Synchronization:** Introduction- Clock Synchronization: How computer clocks are implemented-Drifting of clocks-Mutual Exclusion-Election Algorithms: Bully algorithm-Ring algorithm. **Process Management:** Introduction- Process Migration: Features-Mechanisms-Heterogeneous systems-Advantages- Threads: Motivations-Models-issues-implementation.		**15**
Unit V	**Distributed File Systems:** Introduction- Desirable Features of a Good Distributed File System- File Models- File-Accessing Models- File-Sharing Semantics- File-Caching Schemes- Design Principles. **Case Studies:** Introduction-Amoeba-V-System-Mach-Chorus-A Comparison of Amoeba,V-System,Mach and Chorus.		**14**
Total Contact Hrs			**75**
Text Books:	1. Pradeep k. Sinha, 2000, "Distributed Operating Systems Concepts and Design", 3rd edition, PHI publications		

Reference Books:	1. James L. Peterson & Silberschatz.A, 2001, "Operating System Concepts", World Student Edition, 2nd Edition , Addison Wesley 2. Andrew S. Tenenbaum, 2015, " Modern Operating Systems", 4th edition, Prentice Hall 3. Dietel H.M., 2000, "An Introduction to Operating Systems", World Student Edition, Addison Wesley

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R.Nandhakumar		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS2N1	**Title:** Non-Major Elective I: Networking Technologies	**Semester:** II
Hrs/Week:	1	**Credit:** 2
Objectives	On Successful completion of the course the students should have gained in - depth knowledge of Networking concepts, Internet protocols and their functionalities.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction to Computer Network:** Fundamental concepts of Network- Data communications-Protocols-Standards- Signal Propagation: Analog and Digital signals-Types of Networks: LANs (Local Area Networks)-WANs (Wide Area Networks)- MANs (Metropolitan area Networks).	**3**
Unit II	Internet-Intranet-Search engines- Modes of Data Transmission Parallel and Serial-Synchronous and Asynchronous - Simplex, Half-duplex, Full-duplex communications.	**2**
Unit III	**Multiplexing:** Types of Multiplexing- Network Topologies: What is a Network topology? Types of topology.	**3**
Unit IV	Bridges- Ethernet- Switches-Routers-Gateway-Modem.	**4**
Unit V	IP Addresses-FTP-Email-WWW. Recent trends: Bluetooth- WiFi- Wi max-RF.	**3**
Total Contact Hrs		**15**
Text Books:	1. Godbole. A.S., "Data Communication and Networks", Tata McGraw-Hill publications	
Reference Books:	1. Arew S. Tannenbaum, 2003, "Computer Networks", 4th Edition, Prentice hall of India 2. Stallings. W, 2004, "Data and Computer Communications", 7th Edition, Prentice hall of India	

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Department	**Computer Science (SF)**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS2N2	**Title:** Non-Major Elective I: Client-Server Technologies	**Semester:** II	
Hrs / Week:	**1**	**Credit : 2**	
Objectives	To inculcate Knowledge on Client / Server Concepts and various components of client / server Applications.		
Units	**Contents**		**Hrs**
Unit I	Client / Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.		9
Unit II	Components of Client / Server Applications – The Client: Role of a Client – Client Services – Request for Service. Components of Client / Server Applications – The Server: The Role of a Server – Server Functionality in Detail.		10
Unit III	Components of Client / Server Applications – Connectivity: Open System Interconnect – communications Interface Technology – Inter-process communication.		11
Unit IV	Components of Client / Server Applications – Software. Components of Client / Server Applications – Hardware.		10
Unit V	Components of Client / Server applications – Service and Support: System Administration. The Future of Client / Server Computing: Enabling Technologies.		10
	Total Contact Hrs		**50**
TEXT BOOKS	1. Client / Server Computing – Patrick Smith, Steve guenferich , 2nd edition, PHI.		
REFERENCES	1. "Robert Orfali, Dan Harkey, Jeri edwards: the essential client/server survival guide", II edition galgotia publication private limited. 2. "Dewire and Dawana Travis "Client/ Server Computing ", TMH.		

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LAB EXERCISE

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS209	**Title:** Programming Lab-III : Open Source And Computing Tools Lab	**Semester:** II
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should have understood the concepts of Open Source Technologies.	

- Create a program to implement looping in vb.net
- Create a program to implement conditional statements
- Create a calculator using basic controls
- Create a notepad editor using Context menu strip and menu controls
- Create an application to illustrate the use validation controls.
- Create an application for library management system
- Create an application for Pay roll processing system
- Create a program to generate electricity Bill
- Write a server side PHP program that displays marks, total, grade of a student in tabular format by accepting user inputs for name, number and marks from a HTML form.
- Write a PHP program that adds products that are selected from a web page to a shopping cart.
- Write a PHP program to access the data stored in a mysql table.
- Write a PHP program interface to create a database and to insert a table into it.
- Write a PHP program using classes to create a table.
- Write a PHP program to upload a file to the server.
- Write a PHP program to create a directory, and to read contents from the directory.
- Write a shell program to find the details of an user session.
- Write a shell program to change the extension of a given file.
- Create a MySQL table and execute queries to read, add, remove and modify a record from that table.

Total Contact Hrs	**75**

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Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS210	**Title:** Programming Lab-IV: Networks	**Semester:** II
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should understand the concepts of Client/Server , TCP,UDP.	

- Program to implement the concepts CRC.
- Program to Parse URL Address into its components.
- Program to find Shortest Path between nodes.
- Implement the concept of Sliding Window Protocol.
- Program to read Source code of a Website.
- Write a Java program to find the IP address of a given Website.
- Write a Java program to Download a file from the internet and save a copy.
- Write a Java program to calculate the Area with the radius between C/S.
- Write a Java program to generate IP of the machine.
- Write a Java program to establish Single side communication using TCP.
- Write a Java program to establish Double side communication using TCP.
- Write a Java program to establish Single side communication using UDP.
- Write a Java program to establish Double side communication using UDP.
- Write a Java program to send a single message to multiclient[Broadcasting].
- Write a Java program to implement UDP packets Send and Receive.
- Write a Java program to generate Conversion of lowercase to uppercase.
- Write a Java program to establish Gossip Client and Server.
- Write a Java program to generate Daytime Client and Server.
- Write a Java program to establish a Commandline who is client.
- Write a Java program to implement the Concurrent Server.
- Write a Java program to implement Ping Server using raw sockets.
- Write a Java program to demonstrate the ECHO command.
- Write a Java program to demonstrate the PING command.
- Write a Java program to print DNS record of an internet address.
- Write a Java program to establish Chatting.
- Write a Java program to validate a Client Password.
- Write a Java program to perform File Transfer using FTP.
- Write a Java program to generate Asynchronous Protocol.
- Write a Java program to implement Stop and Wait Protocol.
- Write a Java program to implement Client-Server Cryptography.
- Write a Java program to implement User Interface.
- Write a Java program to send a mail using SMTP.

Total Contact Hrs	**75**

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SEMESTER III

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS311	**Title:** J2EE Technologies	**Semester:** III
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should have understood the features of Java and the Web services.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction to JFC:** JPanel-JFrame-JApplet-JSplitPane-JTabbedPane-JViewport-JMenu-Items and Labels - JtextField - JTextArea - JButtons - JButton Classes - JCheckBoxes - JRadioButton-JComboBoxes-JList.	**14**
Unit II	**Advanced JFC Components:** JTree s- JTables – JinternalFrame - JDesktop Manager -JProgressbar.	**13**
Unit III	Java Beans: Introduction to Java Bean-Advantages of a Java Bean-Application Builder tools-The Bean Developer Kit(BDK)-Jar files-Introspection-Developing a Simple Bean-Using Bound Properties-Using Bean Info Interface-Constrained Properties-Persistence-Customizers-Java Bean API.	**15**
Unit IV	**Servlet Overview and Architecture:** Movement to Server Side Java-Practical Applications for Java Servlets-Java Servlet Alternatives-Reason to use Java Servlets-Java Server Architecture –Servlet Basics-The Lifecycle of Servlet-A Basic Servlet. **Servlet Chaining:** Definition for Servlet Chaining-Uses of Servlet Chains-A Practical example using Servlet Chaining-Servlets and JDBC-Two Tier and Three Tier Database access models-JDBC Servlet-Session Tracking-Using Cookies-Using Session Objects.	**17**
Unit V	**Java Server Page (JSP):** Beans - Conditions - Directives - Declarations – Implicit Variables -Expressions. **RMI (Remote Method Invocation):** Introduction - RMI Architecture-Bootstrapping and RMI Registry - The RMI Compiler - Object Specialization and Parameter Passing - A Simple example.	**16**
Total Contact Hrs		**75**

Text Books:	1. Patric Naughton,Herbert Schildt, 2001, " The Complete Reference-Java", 5th Edition, Tata McGraw Hill 2. Sams Series,James GoodWill, 2004, "Developing Java Servlets", 1st Edition, SAMS Techmedia 3. Dr.Sathya Raj pantham, 2000, "Pure Java Swing", 1st Edition, Tech Media Publication 4. Sam Series, 1996, "Java RMI", Tata McGraw Hill
Reference Books:	1. Harley Hahn, 1996, "The Internet – Complete Reference", 2nd edition, Tata McGraw-Hill International Editions 2. Patric Naughton, 1996, "The Java Hand Book", 3rd Edition, Tata McGraw Hill 3. Stephen Potts, Mike Kopack, 2004, "Web Services", Kindle Edition, Pearson Education

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N.Yasodha		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS312	**Title:** Digital Image Processing	**Semester:** III
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should have to understand the fundamentals of Digital Image Processing, image compression and segmentation.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction:** What is Digital image processing – the origin of DIP – Examples of fields that use DIP – Fundamentals steps in DIP – Components of an image processing system. **Digital Image Fundamentals:** Elements of Visual perception – Light and the electromagnetic spectrum – Image sensing and acquisition – Image sampling and Quantization– Some Basic relationship between Pixels – Linear & Nonlinear operations.	**15**
Unit 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 – Sharpening spatial filters – combining spatial enhancement methods.	**15**
Unit III	**Image Restoration:** A model of the Image Degradation / Restoration Process – Noise models – Restoration is the process of noise only – Spatial Filtering – Periodic Noise reduction by frequency domain filtering –Modeling the Degradation function –Direct Inverse Filtering-Wiener Filtering-Constrained Least Squares(Regularized)Filtering-Wiener Filtering-Constrained Least squares(regularized)Filtering-Iterative Nonlinear Restoration using the Lucy-Richardson Algorithm-Blind Deconvolution –Image Reconstruction from projections.	**16**
Unit IV	**Image Compression:** Fundamentals – Image compression models – Elements of Information Theory – Error Free compression – Lossy compression – Image compression standards-coding redundancy-spatial redundancy.	**14**
Unit V	**Image Segmentation:** Detection and Discontinuities – Edge Linking and Boundary deduction – Threshold – Region-Based segmentation – Segmentation by Morphological watersheds – The use of motion in segmentation.	**15**
Total Contact Hrs		**75**
Text Books:	1. Rafael C. Gonzalez, Richard E. Woods, 2009, "Digital Image Processing", 2nd Edition, PHI/Pearson Education 2. Rafael C. Gonzalez, Richard E. Woods, 2009, "Digital Image Processing", 3rd Edition, PHI/Pearson Education 3. Rafael C. Gonzalez, Richard E.Woods,Steven L.Eddins, 2005, "Digital Image Processing Using MATLAB" , 2nd Edition , Tata McGraw-Hill International Editions	

Reference Books:	1. Nick Efford, 2004, "Digital Image Processing a practical introducing using Java", Pearson Education 2. Chanda.B, Dutta Majumder.D, 2003, "Digital Image Processing and Analysis", PHI

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Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS313	**Title:** Computing Technologies	**Semester:** III
Hrs/Week:	4	**Credit:** 3
Objectives	On successful completion of the course the students should understand the concepts of cloud computing, understood the developing cloud services, understood the Centralizing Email communications and cloud computing services.	

UNITS	**Contents**	**Hrs**
Unit I	**Fundamentals of grid and cloud computing:** Introduction to Grid computing-Merging the Grid Services Architecture with the Web Services Architecture. Introduction to Cloud computing – History of Cloud Computing –How Cloud Computing works-Companies in the Cloud Computing Today.	**11**
Unit II	**Developing cloud services:** Computing in the Cloud - The Pros and Cons of Cloud Computing-Benefits of Cloud Computing. Developing Cloud Services: Web Based Application – 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 – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.	**12**
Unit III	**Cloud computing for everyone**: Centralizing Email communications – collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.	**11**
Unit IV	**Using cloud services:** Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management –Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.	**13**
Unit V	**Grid computing:** Open Grid Services Architecture (OGSA) – Sample Use Cases that drive the OGSA – The OGSA Platform Components – Open Grid Services Infrastructure (OGSI) – OGSA Basic Services.	**13**
Total Contact Hrs		**60**

Text Books:	1. Joshy Joseph & Criag Fellenstein, 2009, "Grid Computing", PHI, PTR 2. Michael Miller, August 2009 , "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing
Reference Books:	1. Jose C.Cunha, Omer F.Rana (Eds), 2006, "Grid Computing", Springer International Edition 2. Anthony T. Velte and others, 2011 , "Cloud Computing" TATA Mc-Graw Hill Publications, New Delhi

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S.Sharmila		M.Sakthi		

ELECTIVE III

S.No	SUBJECT CODE	TITLE
1	**15PCS3E1**	**ERP AND ITS APPLICATIONS**
2	15PCS3E2	MANAGING ORGANIZATION
3	15PCS3E3	HUMAN RESOURCE MANAGEMENT
4	15PCS3E4	MARKETING MANAGEMENT

Department	**Computer Science**		
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017	
Subject Code: 15PCS3E1	**Title:** ELECTIVE – III ERP and its Applications	**Semester:** III	
Hrs/Week:	4	**Credit:** 3	
Objectives	On successful completion of the course the students should understand the concepts of enterprise and its applications.		
UNITS	**Contents**		**Hrs**
Unit I	**RP And Technology:** Introduction – Related Technologies – Business Intelligence–E-Commerce and E-Business – Business Process Reengineering – Data Warehousing – Data Mining – OLAP– Product life Cycle Management – SCM – CRM.		**10**
Unit II	**ERP Implementation:** Implementation Challenges – Strategies – Life Cycle –Pre- implementation Tasks – Requirements Definition – Methodologies – Package selection – Project Teams – Process Definitions– Vendors and Consultants–Data Migration–Project management–Post Implementation Activities.		**12**
Unit III	**ERP in Action & Business Modules:** Operation and Maintenance – Performance – Maximizing the ERP System – Business Modules – Finance – Manufacturing – Human Resources – Plant maintenance – Materials Management – Quality management – Marketing – Sales, Distribution and service.		**13**
Unit IV	**ERP Market:** Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intutive.		**13**
Unit V	Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.		**12**
Total Contact Hrs			**60**
Text Books:	1. Alexis Leon, 2008, "ERP DEMYSTIFIED", 2nd Edition, Tata McGraw Hill 2. Mary Sumner, 2007, "Enterprise Resource Planning", Pearson Education		
Reference Books:	1. Jim Manzullo, 2007, "SAP R/3 for Everyone", Pearson 2. Jose Antonio Fernandez, 1998, " The SAP R /3 Handbook", Tata McGraw Hill 3. Biao Fu, "SAP BW: A Step-by-Step Guide", 1st Edition, Pearson Education		

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Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS3E2	**Title:** Managing Organization	**Semester:** III
Hrs/Week:	4	**Credit:** 3
Objectives	On Successful completion of the course the students should have Gained Knowledge of Managing organization and its processing.	

UNITS	**Contents**	**Hrs**
Unit I	**Evolution of Management Thought :** Scientific Management, Classical Organization Theory School, Management Science School, Behavioral School, Systems Approach and Contingency Approach. Concept of Management: Definition, Need, Concept and Nature of Management, Skills & Management Levels, Managing in Present Competitive Environment.	**12**
Unit II	**Process of Management:** Planning; Organizing- departmentalization, Line and Staff relationship; Directing; Coordinating & Controlling; Decision Making; Authority and Responsibility.	**13**
Unit III	**Elements of Human Behavior at Work:** Definition, Concept, Need, Importance and Foundations of Organizational Behavior, Personality, Perceptual Processes, Management and Behavioral applications of Personality, and Perception.	**12**
Unit IV	**Psychological Variables and Communication Technology:** Learning; Values and Attitudes; Motivation; Management and Behavioral Applications of Attitude and Motivation on Performance.	**13**
Unit V	**Leadership:** Style and Functions of Leader, Transformational -Transactional, Charismatic-Visionary Leadership, Likert's Four Systems of Leadership and Managerial Grid. **Organizational Conflict:** Concept, classification, process and conflict resolution strategies. **Organizational Culture:** Concept, Process and Implications of organizational Culture **Organizational Change:** Concept, Nature, Kurt Lewin Theory of Change, Implementing Change, Managing Resistance to Change.	**10**
Total Contact Hrs		**60**

Text Books:	1. Rao.V.S.P, "Managing Organization",1st Edition 2. Chaturvedi, Saxena, "Managing Organization", Himalaya Publication 3. Koontz Harold, Weihrich Heinz, 2008, "Essentials of management", 5th Edition, Tata Mc Graw Hill
Reference Books:	1. Newstrom John., "Organizational Behaviour: Human Behaviour at Work", 12th Edition, Tata Mc Graw Hill 2. Luthans Fred, "Organizational Behaviour", 10th Edition, Tata Mc Graw Hill 3. Mc Shane L. Steven, Glinow Mary Ann Von & Sharma Radha.R, "Organizational Behaviour", 4th Edition, Tata McGraw Hill

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M.Dhavapriya		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS3E3	**Title:** Human Resource Management	**Semester:** III
Hrs/Week:	4	**Credit:** 3
Objectives	On successful completion of the course the students should understand the concepts of human resource management and maintenance.	

UNITS	**Contents**	**Hrs**
Unit I	**Introduction:** Introduction to Human Resource Management and its definition, functions of Human Resource Management & its relation to other managerial functions. Nature, Scope and Importance of Human Resource Management in Industry, Role & position of Personnel function in the organization.	**12**
Unit II	**Procurement and Placement:** Need for Human Resource Planning; Process of Human Resource Planning; Methods of Recruitment; Psychological tests and interviewing; Meaning and Importance of Placement and Induction, Employment Exchanges (Compulsory Notification of vacancies) Act 1959, The Contract Labour (Regulation & Abolition) Act 1970.	**11**
Unit III	**Training & Development:** Difference between training and Development; Principles of Training; Employee Development; Promotion-Merit v/s seniority Performance Appraisal, Career Development & Planning.	**13**
Unit IV	**Job analysis & Design:** Job Analysis: Job Description & Job Description, Job Specification. **Job Satisfaction**: Job satisfaction and its importance; Motivation, Factors affecting motivation, introduction to Motivation Theory; Workers ' Participation, Quality of work life.	**12**
Unit V	**Integration:** Human Relations and Industrial Relations; Difference between Human Relations and Industrial Relations, Factors required for good Human Relation Policy in Industry; Employee Employer relationship Causes and Effects of Industrial disputes; Employees Grievances & their Redressed, Administration of Discipline, Communication in organization, Absenteeism, Labor Turnover, Changing face of the Indian work force and their environment, Importance of collective Bargaining; Role of trade unions in maintaining cordial Industrial Relations.	**12**
Total Contact Hrs		**60**
Text Books:	1. T.N.Chhabra.T.N, "Human Resource Management", Dhanpat Rai & Co. 2. Dessler, 2007, "Human Resource Management", 13th Edition, Pearson Education Limited	

Reference Books:	1. Mamoria C.B and Mamoria.S, 2011, "Personnel Management", 5th Edition, Himalaya Publishing Company 2. Bernadin, 2012, " Human Resource Management", 6th Edition, Tata McGraw Hill Eugence Mckenna and Nic Beach, 2008, "Human Resource Management", 2nd Edition, Pearson Education Limited

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M.Dhavapriya		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS3E4	**Title:** Marketing Management	**Semester:** III
Hrs/Week:	4	**Credit:** 3
Objectives	On successful completion of the course the students should understand the concepts of marketing theory and its practical application.	

UNITS	**Contents**	**Hrs**
Unit I	**Core Concepts of Marketing:** Concept, Meaning, definition, nature, scope and importance of marketing, Goods – Services Continuum, Product, Market, Approaches to Marketing – Product – Production - Sales – Marketing – Societal – Relational. Concept of Marketing Myopia, Holistic Marketing Orientation, Customer Value, Adapting marketing to new liberalised economy - Digitalization, Customization, Changing marketing practices	**11**
Unit II	**Market Analysis and Selection:** Nature and Contents of Marketing Plan, Marketing environment, Controllable and Uncontrollable factors effecting marketing decisions, Analyzing latest trends in Political, Economic, Socio-cultural and Technical Environment, Concept of Market Potential & Market Share, Concept, Characteristics of consumer and organizational markets, Buyer Behavior, 5 step Buyer decision process Meaning and concept of market segmentation, Bases for market segmentation, Types of market segmentation, Effective segmentation criteria, Evaluating & Selecting, Target Markets, Concept of Target Market, Positioning and differentiation strategies, Concept of positioning – Value Proposition & USP, Marketing Information System, Strategic marketing planning and organization.	**12**
Unit III	**Product Decision:** Concept of a product; Classification of products; Major product decisions; Product line and product mix; Branding; Packaging and labeling; Product life cycle – strategic implications; New product development and consumer adoption process.	**13**
Unit IV	**Price Decision:** Concept, and Meaning of Price and Pricing, Significance of Pricing Decision, Factors affecting price determination; Pricing Methods and Techniques, Pricing policies and strategies; Discounts and rebates.	**11**
Unit V	**Place Decision:** Nature, functions, and types of distribution channels; Distribution channel intermediaries; Channel management decisions, Marketing channel system - Functions and flows; Channel design, Channel management - Selection, Training, Motivation and evaluation of channel members; Promotion Decision Communication Process; Promotion mix – advertising, personal selling, sales promotion, publicity and public relations; Media selection; Advertising effectiveness; Sales promotion – tools and techniques.	**13**
Total Contact Hrs		**60**

Text Books:	1. Philip Kotler, Agnihotri, "Principle of marketing", 13th Edition, Pearson Education 2. Ramaswamy V.S. and Namakumari S, "Marketing Management: Planning, Implementation and Control", 3rd Edition, Macmillian 3. Rajan Saxena, "Marketing Management", Tata McGraw Hill
Reference Books:	1. R Kumar & Goel, 2013, "Marketing Management", UDH Publishers 2. Tapan Panda, "Marketing Management", ExcelBooks 3. Stanton William.J, "Fundamentals of Marketing", TATA Mc Graw Hill 4. Etzel M.J., Walker B.J. and Stanton William J, " Marketing concept & Cases special", 13th Edition, Tata McGraw Hill

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LAB EXERCISE

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS314	**Title:** Programming Lab-V: J2EE Technologies	**Semester:** III
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should understand the concepts of Web services, EJB and RMI.	

JFC Components:

Generate a JButton using Swing components
Menu Creation using Swing components
Implement String Handling concepts
Demonstrate JTabbedPane
List the structure of JTree
Create a JTable using Swing Components.
Generate a Progress Bar Swing components
Generate a Scroll Pane Swing components
Generate a Combo Box Swing components
Generate a Radio Button Swing components

Servlet:

Demonstrate Generic Servlet.
Demonstrate HTTP Servlet
Demonstrate Servlet Chaining
Demonstrate JDBC Connectivity
Demonstrate JDBC using Servlet
Demonstrate Cookies.

Bean:

Demonstrate Juggler Bean
Demonstrate Molecular Bean
Implement Simple Property Bean
Create a program for Introspection

JSP:

Create a JSP program for Fibonacci Series

RMI:

Create a RMI Program for Student Mark list
Create a RMI Program for Greatest of Two Numbers

Total Contact Hrs	**75**

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N.Yasodha		M.Sakthi		

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS315	**Title:** Programming Lab-VI : Digital Image Processing Lab	**Semester:** III
Hrs/Week:	5	**Credit:** 4
Objectives	On Successful completion of the course the students should understand about Image Processing, image compression and segmentation using MATLAB.	

- Crop, Resize, Rotate an image
- Crop an image using Simulink
- Resize an image using Simulink
- Rotate an image using Simulink
- Adjusting the contrast in color image using Simulink
- Adjusting the contrast in intensity image using Simulink
- Conversion from Color to Grayscale
- Finding Histogram of a gray and negative image
- Arithmetic Operations
- Blurring with Deconvolution Algorithm
- Sharpening of an image using Simulink
- Unsharp Masking and High Boost Filtering using Simulink
- Removing Salt & Pepper noise
- Remove Noise (Median Filter) using Simulink
- Deblurring with Wiener Filter
- Correct Non-Uniform Illumination using Simulink
- Count Object in an image using Simulink
- Image Compression using Discrete Cosine Transform.
- Performing Morphological Operations.
- Edge Detection using Prewitt, Sobel and Roberts.

Note: Laboratory works are to be done on MATLAB 7.0 tool.

Total Contact Hrs	**75**

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Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS316	**Title:** Pilot Project-I	**Semester:** III
Hrs/Week:	-	**Credit:** 6
Objectives	On Successful completion of the course the students understand in analyzing, designing, implementation and evaluation of software.	

Prerequisite Knowledge: SDLC, Models for Software Engineering, OOPs, Basic DBMS concepts, Design Techniques like DFD or UML etc., Basic Information of Business Processes according to project title.

Instructional Notes: Students are required to develop entire new software system or to enhance/modify functionalities of existing software or to provide customization based on existing technology/framework to fulfill specific requirements.

Rules for the Project:

1. The duration of the project will be 50 days. The students can develop their project individually or in a group of not more than 2 students. Group size can be increased with prior approval of head of institution.
2. The passing standard is 40% jointly in Internal and External examination.
3. The project can be developed in any language or platform but it is required to get approved by the head of the institution. For the purpose of approval, Students have to submit their project titles and proposals with the name of Internal and External Guides to the Head of Institution. In case, if the student proposal is rejected, the revised proposal in the same or other area is required to submit and get it sanctioned. Failing to do this, his/her term will not be granted.
4. The students have to report to the internal guide for at least 4 times during the project life span with the progress report duly signed by external guide. Moreover they have to bring these reports with the final report at the time of external examination.

SEMESTER IV

Department	**Computer Science**	
Course	**M.Sc.,**	**Effective from the Year:** 2015-2017
Subject Code: 15PCS417	**Title:** Industrial Project Work And Viva Voce (Individual)	**Semester:** IV
Hrs/Week:	-	**Credit:** 8
Objectives	Provide experience to the students in analyzing, designing, implementation and evaluation of software.	

Instructional Notes: Students are required to develop entire new software system or to enhance/modify functionalities of existing software or to provide customization based on existing technology/framework to fulfill specific requirements.

MAXIMUM MARKS : 200

PROJECT EVALUATION : 80+80=160

VIVA-VOCE : 20+20=40