MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc Information Technology and System Management
(Choice Based Credit System)
(with effect from the academic year 2017- 2018 onwards)

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits
III	**Advanced Java Programming**	**Core-10**	**4**	**4**
	Web Designing	**Core-11**	**4**	**4**
	Software Project Management	**Core-12**	**4**	**4**
	Research Methodology	**Core-13**	**4**	**4**
	Elective-2 (select any one from Elective – II group)	**Elective -2**	**4**	**3**
	Java programming Lab	**Core Practical-5**	**4**	**2**
	Mini Project	**Core Project-1**	**6+6***	**6**
IV	**Main Project Lab**	**Core Project-2**	**30+2***	**16**

*Extra hours for Project

For the Project, flexible credits are b/w 5 – 8 & Hours per week are b/w 10 - 16.

Total number of credits ≥ 90	:	90
Total number of Core Courses	:	20 (13 T + 5 P + 2 Prj.)
Total number of Elective Courses	:	2
Total hours	:	120

List of Electives offered:

Elective – I Group

(A) Artificial Intelligence
(B) Big Data Analytics

Elective – II Group

(A) Data Warehousing and Mining
(B) Mobile Computing

REGULATIONS
(Effective from the academic year 2017-2018 onwards)

1. Eligibility for Admission:

Candidates for admission to the first year of two year M.Sc. Information Technology and System Management shall be required to have passed any degree from a recognized University accepted by the Syndicate of this University.

2. Duration of the Course:

The course shall be extended for a period of two academic years consisting of four semesters with two semesters per year.

3. **Passing Requirement:**

The candidate will be declared to have passed in any subject (including practical and project viva voce) of study if he/she secures not less than 50 marks in the University end semesters examinations of their subjects.

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Semester -III / Ppr.no.15 / Core-14

L-T-P-C

ADVANCED JAVA PROGRAMMING

4 -0-0- 4

Preamble : Understanding advanced features in Java programming

Prerequisite : Basic knowledge in core java

Unit-I

Introducing Java:

The Evolution of Java-The logical evolution of C to C++ and Java-Object oriented programming concepts and java programming with java. Getting started with Java Developer's kit(JDK)- The Java developer's environment. The Java browser and the world wide web –Navigating the world wide web –using URL's- web surfing with Java enchanced browsers –Web-Hot spots for Java developers-Java tools-Java language. **(13L)**

Unit-II

Fundamentals of Java language:

Token-Using data types-Expressions-Declarations-control flow-Building objects-An introduction to classes- working with objects-packages-Inheritance-Interfaces-threads-exceptions-streams. **(10L)**

Unit-III

Java API packages:

The structure of API Packages. Using the Java API, API web reference Structure. The Java Applet class, Java language- packages and its classes. The AWT class library-Introduction to the AWT-Using the frame class to implement application windows- Implementing dialog boxes with dialog class –organizing the components using the panel and layout classes-using common GUI controls-using Fonts - image related classes-using scroll bars. The java I/O and utility class libraries. The Net and debug class libraries **(12L)**

Unit-IV

Defining the applet structure:

Building the applet- The Java extensions to HTML – Adding animation to web documents. The reducing animation flickers- Publishing a Java- presentation on the web. Applets reuse-adding functionality to existing applets –when to reuse –when to rewrite-extending an applet-Testing the extended applet.

JDBC: Java Database Connectivity, Types of JDBC drivers, Writing JDBC applications, Types of Statement objects, Types of resultset, Inserting an updating records, using transactions. **(13L)**

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Unit-V

Java Servlets:

Java Servlets and CGI Programming –A Simple Java Servlet –Anatomy of a Java Servlet Reading Data from a Client –Sending Data to a Client – Working with Cookies Java Server Pages: JSP-JSP tags-Tomcat-Request String –User sessions-Cookies-Session Object. **(12L)**

REFERENCE BOOKS

1. Peter Norton And William Stanek –Peter Norton's Guide to Java Programming-Techmedia-1997
2. Alan.R.Willamson and Ceri L.Moran-Java Database Programming –Prentice Hall 1997.
3. C.Muthu, Programming with Java, 2nd Edition ,VNI
4. Joseph O'Neil, Java Beans Programming, TMH

OUTCOMES:

Upon Completion of the course, the students will be able to:

- Implement Java programs.
- Make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API
- Design and implement server side programs using Servlets and JSP.

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Semester -III / Ppr.no.16 / Core-15

L-T-P-C

WEB DESIGNING **4 -0-0- 4**

Preamble : Understanding internet and web programming

Prerequisite : Basic knowledge in web page designing

Unit-1

Web programming Basics and Installations:

Web Publishing: A Quick look-HTML 4.0: the web Publishing Foundation- HTML basics- Putting your Server to work-Server side programming- XML Basics. **(10L)**

Unit-II

Installation and Configuration:

Getting up and running: Installation Quick Start Guide- Installing and configuring MySql-Installing and configuring Apache-Installing and configuring PHP. **(10L)**

Unit-III

PHP Language Structure:

The Building blocks of PHP- Flow Control Functions in PHP- Working with Functions- Working with Arrays- Working with Objects- Working with Strings, Dates and Time- Working with Forms- Working with Cookies and User Sessions- Working with Files and Directories Working with Images **(13L)**

Unit-IV

PHP and MySQL Integration:

Understanding the Database Design- Process Learning Basic SQL Commands Using Transactions and Stored Procedures in MySQL- Interacting with MySQL Using PHP. **(13L)**

Unit-V

Basic Projects:

Managing a Simple Mailing List- Creating an Online Address Book- Creating a Simple Discussion Forum- Creating an Online Storefront and shopping Cart Mechanism- Creating a Simple Calendar- Restricting Access to Your Applications- Logging and Monitoring Web Server Activity- Application Localization- Working with XML- Connecting to Web Services Apache Performance Tuning and Virtual Hosting- Setting Up a Secure Web Server- Optimizing and Tuning MySQL **(14L)**

REFERENCE BOOKS

1. Sam Teach Yourself PHP, MySQL and Apache All in One, 5th Edition, Julie Meloni
2. Dynamic Web Publishing, Second Edition, Shelley Powers, Techmedia
3. Steve Suehring, Tim Converse and Joyce Park, ”PHP 6 and MySQL 6 Bible”, Wiley India reprint, 2009.
4. Robert Sheldon, Geoff Moes, ”Beginning MySQL”, Wrox, 2005.
5. BEN FORTA, ”MySQL Crash course “SAMS, 2006.

OUTCOMES:

Upon Completion of the course, the students should be able to:

- Design and implementation of web forms and client side validation.
- XML authoring, Parsing, and related technologies.
- Create a basic website using HTML and Cascading Style Sheets.
- Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.
- Design and implement simple web page in PHP, and to present data in XML format.

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Semester -III / Ppr.no.17 / Core-16

L-T-P-C

SOFTWARE PROJECT MANAGEMENT **4 -0-0- 4**

Preamble : To learn the concepts of project planning and monitoring.

Prerequisite : Basic knowledge in Software Engineering

Unit-I
System Development:
Object Basics - Development Life Cycle - Methodologies - Patterns - Frameworks - Unified Approach – UML. **(12L)**

Unit-II
Use-Case Models:
Object Analysis: Object relations - Attributes - Methods - Class and Object responsibilities - Case Studies. **(11L)**

Unit-III
Design Processes:
Design Axioms - Class Design - Object Storage - Object Interoperability - Case Studies. **(10L)**

Unit-IV
User Interface Design:
View layer Classes - Micro-Level Processes - View Layer Interface - Case Studies. **(13L)**

Unit-V
Testing and Case studies:
Quality Assurance Tests - Testing Strategies - Object orientation on testing - Test Cases - test Plans - Continuous testing - Debugging Principles - System Usability - Measuring User Satisfaction - Case Studies. **(14L)**

1. Bahrami, 1999, Object Oriented Systems Development, Tata McGraw Hill International Edition.
2. G. Booch, 1999, Object Oriented Analysis and design, 2nd Edition, Addison Wesley, Boston
3. R.S.Pressman, 2005, Software Engineering, 6th Edition, Tata McGraw Hill, New Delhi.
4. Rumbaugh, Blaha, Premerlani , Eddy, Lorensen, 2003, Object Oriented Modeling And design , Pearson education, Delhi.

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OUTCOMES:

At the end of this course, the students should be able to:

- Understand the activities during the project scheduling of any software application.
- Learn the risk management activities and the resource allocation for the projects.
- Acquire knowledge and skills needed for the construction of highly reliable software project

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L-T-P-C

RESEARCH METHODOLOGY **4 -0-0- 4**

Preamble : Understanding the concepts of Research approaches, tools etc

Prerequisite : Basic knowledge in computer algorithms, Statistics etc.

Unit-I

Research Methodology:

An Introduction - Meaning of Research - Objectives of Research - Types of Research, Motivation in Research - Research Approaches, Significance of Research - Research Methods Verses Methodology - Research and Scientific Method - Research Process - Criteria of Good Research - Problems Encountered by Researchers in India. Defining the Research Problem: What is a Research Problem? - Selecting the Problem - Technique Involved in Defining a Problem - Research Design: Meaning - Need for research Design - Features of a Good Design - Important Concept relating to Research Design - Different Research Designs - Basic Principles of Experimental Designs. **(12L)**

Unit-II

Sampling Design:

Census and sample survey:

Implications of a sample design - Steps in sample design - Criteria of selecting a sampling procedure - Characteristics of a good sample design - Different types of sample designs - How to select a random sample? - Random sample from an infinite Universe - Complex random sampling designs - Measurement and scaling Techniques: measurement in research - Measurement scales - Sources of error in measurement - Tests of sound measurements - Technique of developing measurement tools - Scaling, meaning of scaling - Scale classification bases - Important scaling techniques - Scale construction techniques. **(12L)**

Unit-III

Methods of Data Collection:

Collection of Primary Data - Observation Method - Interview method - Collection of Data through Questionnaires - Collection of Data through Schedules - Some Other Methods of Data Collection - Collection of Secondary Data - Selection of Appropriate Method for Data Collection - Interpretation and Report writing - Meaning of Interpretation, Why Interpretation? - Technique of Interpretation, Precaution in Interpretation - Significance of Report Writing - Different Steps in Writing Report - Layout of the Research Report - Types of Reports - Mechanics of Writing a Research Report - Precautions for Writing Research Reports. **(12L)**

Unit-IV

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate's correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design

(13L)

Unit - V

Algorithmic Research:

Introduction - Algorithmic Research Problems - Types of Solution procedure/Algorithm - Steps of Development of Algorithm - Steps of algorithmic Research - Design of Experiments and Comparison of Algorithms - Meta Heuristics for Combinatorial Problems - The Computer: Its Role in research - The computer and Computer Technology - The Computer System - Important Characteristics - Computer Applications- Computers and Researchers. **(11L)**

REFERENCE BOOKS:

1. C.R.Kothari, "Research Methodology Methods and Techniques", (Second Revised Edition), New Age International Publishers, New Delhi, 2010.
2. R.Panneerselvam, "Research Methodology", PHI Learning Private Limited, New Delhi, 2009.

OUTCOMES:

At the end of this course, the students should be able to:

- understand some basic concepts of research and its methodologies
- identify appropriate research topics
- select and define appropriate research problem and parameters
- prepare a project proposal (to undertake a project)
- organize and conduct research (advanced project) in a more appropriate manner

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Semester -III / Ppr.no.19 / Elective – 2 (a)

	L-T-P-C
DATA WAREHOUSING AND MINING	4 **-0-0- 3**

Preamble : Understanding concepts of mining and data warehouse structures

Prerequisite : Basic knowledge of Database concepts

Unit-I
Introduction:
Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues – Metrics – Social implications of Data mining **(12L)**

Unit-II
Data Preprocessing:
Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization. **(10L)**

Unit-III
Data Mining Techniques:
Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining **(12L)**

Unit -IV
Classification and Prediction:
Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy **(13L)**

Unit -V
Clustering Techniques:
cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining, Spatial Mining and Temporal Mining **(13L)**

REFERENCE BOOKS

1. J. Han and M. Kamber, 2001, Data Mining: Concepts and Techniques, Morgan Kaufmann, .New Delhi-27
2. M. H.Dunham, 2003, Data Mining : Introductory and Advanced Topics , Pearson Education, Delhi.
3. Paulraj Ponnaiah, 2001, Data Warehousing Fundamentals, Wiley Publishers.
4. S.N. Sivananda and S. Sumathi, 2006, Data Mining, Thomsan Learning, Chennai.

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Semester -III / Ppr.no.19 / Elective – 2 (a)

OUTCOMES

Upon Completion of the course, the students will be able to

- Preprocess the data for mining applications.
- Apply the association rules for mining the data.
- Design and deploy appropriate classification techniques.
- Cluster the high dimensional data for better organization of the data.
- Evolve Multidimensional Intelligent model from typical system
- Discover the knowledge imbibed in the high dimensional system
- Evaluate various mining techniques on complex data objects

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Semester -III / Ppr.no.19 / Elective – 2 (b)

L-T-P-C

MOBILE COMPUTING **4 -0-0- 3**

Preamble : Understanding concepts of mobile communication
Prerequisite : Basic knowledge of communication and Network

Unit-I

Introduction:

Wireless transmission, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, MAC, SDMA, FDMA, TDMA, CDMA, Cellular Wireless Network. **(12L)**

Unit-II

Telecommunication systems:

GSM, GPRS, DECT, UMTS, IMT-2000, Satellite Networks, Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB. **(12L)**

Unit -III

Wireless LAN:

IEEE 802.11, Architecture, Services, MAC, Physical layer, IEEE802.11a-802.11b standards, HIPERLAN, BlueTooth. **(12L)**

Unit-IV

Mobile communication protocols:

Mobile IP, Dynamic Host Configuration Protocol, Routing, DSDV, DSR, Alternative Metrics **(12L)**

Unit –V

WAP and WML:

Traditional TCP, Classical TCP improvements, WAP, WAP 2.0, WML Basics, WML Cards. **(12L)**

REFERENCE BOOKS

1. Jochen Schiller, ”Mobile Communications”, 2/e, PHI/Pearson Education, 2003.
2. William Stallings, ”Wireless Communication and Networks”, PHI/Pearson Education, 2002
3. Kaveh Pahlaven, Prasanth Krishnamoorthy, ”Principles of Wireless Networks”, PHI/Pearson Education, 2003.
4. Hazysztof Wesolowshi, ”Mobile Communication Systems”, John Wiley and Sons Ltd, 2002.

OUTCOMES:

Upon Completion of the course, the students will be able to:

- Gain the knowledge about various types of Wireless Data Networks and Voice Networks.
- Understand the architectures, the challenges and the Solutions of Wireless Communication
- Realize the role of Wireless Protocols in shaping the future Internet.
- Able to develop simple Mobile Application using WML

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Semester -III / Ppr.no.20 / Practical -5

	L-T-P-C
JAVA PROGRAMMING LAB	**0 -0-4- 2**

1. Programs using simple java classes
2. Preparation of employee payroll using arrays and control structures
3. Write a program to prepare mark sheet using inheritance
4. Prepare a salary slip of an employee with personal details using interface
5. Write a java program using string classes
6. Write a java program to design a calculator to perform arithmetic operation
7. Write a java program to create and implement an interface
8. Write a java program to create a thread
9. Program Using runnable interface
10. Write a program using java utilities
11. Database applications using JDBC connectivity
12. Simple Java AWT application
13. Simple Java Servlet application
14. Simple JSP internet application.

OUTCOMES:

Upon Completion of the course, the students will be able to:

- Apply the Object Oriented features of Java for programming on the internet
- Implement, compile, test and run Java program,
- Make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API
- Understand the components and patterns that constitute a suitable architecture for a web application using java servlets
- Demonstrate systematic knowledge of backend and front end by developing an appropriate application.

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Semester -III / Ppr.no.21 / Mini Project

	L-T- P-	C
Mini Project	**O-O-6+6***	**6**

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Semester -IV / Ppr.no.22 / Project

	L-T- P- C
Project	**O-O- 30+2* 16**