MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for M.Sc Networking and Information Technology
(Choice Based Credit System)
(with effect from the academic year 2017- 2018 onwards)

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits
III	**Web Designing**	**Core-10**	**4**	**4**
	Operating Systems	**Core-11**	**4**	**4**
	Network security and Cryptography	**Core-12**	**4**	**4**
	Research Methodology	**Core-13**	**4**	**4**
	Elective-2 (select any one from Elective – II group)	**Elective - 2**	**4**	**3**
	Web Designing and Network 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) Management Information System
(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. Networking and Information Technology 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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WEB DESIGNING **L-T-P-C**

4 - 0- 0- 4

Preamble : Understanding the concepts of PHP and MySQL

Prerequisite : Basic knowledge of programming and internet

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. **(12L)**

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 **(14L)**

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. **(12L)**

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. **(12L)**

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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OPERATING SYSTEMS **L-T-P-C**
4 - 0- 0- 4

Preamble : Understanding the process, Memory and I/O management concepts of operating system
Prerequisite : Basic knowledge of operating system

Unit-I

Operating System Overview:
Objectives and Functions - Processes: Process Description and Control – UNIX SVR4 Process Management – Threads and Multithreading – Symmetric Multiprocesing - Windows Thread Management - Solaris Thread and SMP Management - Linux Thread Management - Android Thread Management **(13L)**

Unit-II

Mutual Exclusion and Synchronization:
Semaphores – Monitors - Message Passing – producer-consumer problem – readers writers problem - Principles of Deadlock – Deadlock prevention – Avoidance – Detection **(12L)**

Unit-III

Virtual Memory Management:
Paging – segmentation - Operating System Software policies - Windows Memory Management - Android Memory Management - Uniprocessor Scheduling: Types of Scheduling - Scheduling Algorithms - Real-Time Scheduling **(10L)**

Unit-IV

I/O Management and Disk Scheduling:
I/O Buffering - Disk Scheduling – RAID - File Management : File Organization and Access - Secondary Storage Management – File Allocation Methods – Free Space Management - Windows File System - Android File Management - Embedded Operating Systems: Characteristics – Ecos **(13L)**

Unit-V

Operating System Security:
Basic concepts - Intruders and Malicious Software - viruses - Distributed Processing, Client/Server, and Clusters: Client/Server Computing - Distributed Message Passing - Remote Procedure Calls – Clusters - Windows Cluster Server – Sun Cluster **(12L)**

REFERENCE BOOKS:

1. Operating Systems-Internals and Design Principles, Williams Stallings, Pearson, 8th Edition, 2014.
2. Modern Operating Systems, Andrew S. Tanenbaum, Pearson,, 4th Edition, 2014.
3. Operating System Concepts, Abraham Silberschatz, Peter B. Galvin, Greg Gagne, John Wiley & Sons, 8th Edition, 2008.

OUTCOMES:

On successful completion of the course the students should have:

- Able to understand the operating system components and its services
- Implement the algorithms in process management and solving the issues of IPC
- Able to demonstrate the mapping between the physical memory and virtual memory
- Able to understand file handling concepts in OS perspective
- Able to understand the operating system components and services with the recent OS

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NETWORK SECURITY AND CRYPTOGRAPHY L-T-P-C

4 - 0- 0- 4

Preamble : Understanding the concepts of security in internet

Prerequisite : Basic knowledge of computer networking and security

Unit-I

Introduction:

Attacks, services and Mechanisms - security attacks - security services - A model for internetwork security - Internet standards and RFCS. Classical Encryption Techniques: symmetric cipher Model - Substitution Techniques -Transportation Techniques Rotor Mechanism – Steganography. **(12L)**

Unit-II

Block ciphers and the data encryption standard simplified DES

Block Cipher Principles -The Data encryption standard -The strength of DES - Differentials and Linear Cryptanalysis -Block Cipher design principles -Block Cipher modes of operations. Public Key Cryptography and RSA: Principles of Public - Key Cryptosystems The RSA Algorithm. **(13L)**

Unit-III

Key Management:

Other Public-Key Cryptosystems: Key Managements- Diffie Hellman Key Exchange-Elliptic curve Arithmetic - Elliptic curve Cryptography Message Authentication & Hash functions: Authentication Requirements-Authentication functions-message Authentication Codes- Hash functions- Security of Hash functions & MACS. Digital Signatures -Authentication Protocols - Digital Signature Standard. **(13L)**

Unit-IV

Authentication applications:

Kerberos X 509 Authentication service. Electronic Mail security: Pretty good Privacy - S/MIME 445 IP Security: IP Security overview - IP Security Architecture -Authentication Header - Encapsulation security Payload. **(10L)**

Unit-V

Web Security:

Web Security Considerations - Secure Sockets Layer and Transport Layer Security - Secure Electronic Transactions System Security: Intruders - Intrusion detection -Password Management. Firewalls: Firewalls Design Principles - Trusted Systems **(12L)**

REFERENCE BOOKS:

1. William Stallings,"CRYPTOGRAPHY AND NETWORK SECURITY - PRINCIPLES AND PRACTICES", Pearson Education, Third Edition, 2003.
2. William Stallings,"NETWORK SECURITY ESSENTIAL - APPLICATIONS AND STANDARDS", Pearson Education, 2003.
3. Atul kahate,"CRYPTOGRAPHY AND NETWORK SECURITY", TMCH, 2003
4. Charlie Kanfman, Radio Pearlman, Mike Speciner, "NETWORK SECURITY", Second Edition, Pearson Education Asia.

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

- Analyze the vulnerabilities in any computing system and hence be able to design a security solution.
- Identify the security issues in the network and resolve it.
- Evaluate security mechanisms using rigorous approaches, including theoretical
- Compare and Contrast different IEEE standards and electronic mail security

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RESEARCH METHODOLOGY **L-T-P-C**

4 - 0- 0- 4

Preamble : Understanding how to do effective research and its measurement facilities

Prerequisite : Basic knowledge of research

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

Data Analysis Tools:

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 **(12L)**

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. **(12L)**

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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DATA WAREHOUSING AND MINING L-T-P-C

4 - 0- 0- 3

Preamble : Understanding data mining and warehousing concepts

Prerequisite : Basic knowledge of DBMS

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. **(11L)**

Unit-III
Data Mining Techniques:
Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining **(11L)**

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.

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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MOBILE COMPUTING **L-T-P-C**

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

Jochen Schiller, "Mobile Communications", 2/e, PHI/Pearson Education, 2003.

1. William Stallings, "Wireless Communication and Networks", PHI/Pearson Education, 2002

2. Kaveh Pahlaven, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.

3. 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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WEB DESIGNING AND NETWORK LAB **L-T-P-C**
0 - 0- 4- 2

Web Designing – Practical Lists

1. Write a HTML code to display information about your college use

   1)Bold Tag

   2)Centre Tag

   3)Heading & Font tags. Add background colour and picture

2. Create a HTML document to display a list of four flowers and link each one to another document displaying brief description of the flower. Add pictures wherever possible.

3. Create a table to display the marks obtained in the exam.

4. Write an HTML code to display a list of 5 cars in a frame. Link each one to a brief description in second frame The left frame should display the list and the right frame should display the paragraph about the frame.

5. Page hit counter
6. Input/output operations
7. Reading/writing files and Directories
8. Calendar application using PHP
9. MySQL Connectivity and Database manipulations
10. Session maintenance in PHP.

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

- Design a system according to customer needs using the available Internet technologies
- Design and implementation of web forms with HTML
- Design and development of PHP pages with MySQL database connectivity.

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Network- Practical Lists

1. Write a socket program for Echo commands
2. Write a socket program for Ping commands
3. Write a socket program for Talk commands
4. Create a socket (TCP) between two computers and enable file transfer between them.
5. Write a socket for HTTP for Web page upload & download
6. Create a Socket (UDP)
7. Write a program for TCP Module implementation
8. Perform a case study for the shortest path routing algorithms to select the network and to select the network path.

OUTCOMES:

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

- Understand the architecture and underlying technologies of TCP/IP.
- Understand Socket Programming.
- Explain routing mechanism within an autonomous system

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

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