

MASTER OF SCIENCE INFORMATION TECHNOLOGY

SYLLABUS: 2017-18 Onwards



Dr. N.G.P ARTS AND SCIENCE COLLEGE (Autonomous)
(Re-Accredited with A Grade by NAAC)
(Affiliated to Bharathiar University,)
Dr. N.G.P. Nagar - Kalapatti Road
Coimbatore-641 048

MASTER OF SCIENCE (INFORMATION TECHNOLOGY) REGULATIONS

ELIGIBILITY

Candidates for admission to the first year course leading to the Degree of Master of Science (INFORMATION TECHNOLOGY) will be required to possess a pass in B.Sc. Computer Science / B.C.A. /B.Sc. Computer Technology / B.Sc. Information Technology /B.Sc Information Sciences/B.Sc Information Systems/ B.Sc. Software Systems/B.Sc Software Sciences / B.Sc Applied Sciences (Computer Science/Computer Technology) / B.Sc. Electronics of any University in Tamil Nadu or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the M.Sc. Information Technology Examination of this College after the programme of study of two academic years.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

- Develop future enhancements in the field of Information Technology and retain professional culture.
- Inculcate quickness in advanced programming languages and build software
- Occupy with applications of Current Technologies in their profession with social and ethical responsibilities.
- Attain the ability required to analyze, design, develop and maintain software development.
- Employ themselves in research oriented fields and life-long learning to adapt with the continuously evolving technology.

	Framework						
17PIT23V	Core Project-I	-	3	20	30	50	4
	Elective-II:	4	3	25	75	100	4
						750	28
17PIT33A	Core-IX : Mobile Operating System	4	3	25	75	100	4
17PIT33B	Core- X : Software Testing	4	3	25	75	100	4
17PIT33C	Core- XI: Big Data Analytics	4	3	25	75	100	4
17PIT33D	Core- XII : Cyber Security	4	3	25	75	100	4
17PIT33P	Core Practical - V : Mobile Applications Development	5	3	40	60	100	2
17PIT33Q	Core Practical - VI : Software Testing	5	3	40	60	100	2
	Elective- III :	4	3	25	75	100	4
						700	24
17PIT43V	Core Project -II:			40	60	100	14
						100	14
Grand Total						2250	90

ELECTIVE- I

(Student shall select any one of the following Course as Elective-I in First semester)

S.No	Course Code	Name of the Course
1.	17PIT1EA	Internet of Things
2.	17PIT1EB	Principles of Programming Languages
3.	17PIT1EC	Advanced Software Engineering

ELECTIVE- II

(Student shall select any one of the following Course as Elective-II in Second semester)

S.No	Course Code	Name of the Course
1.	17PIT2EA	Wireless application protocol
2.	17PIT2EB	Artificial Intelligence And Robotics
3.	17PIT2EC	Mobile Computing

ELECTIVE- III

(Student shall select any one of the following Course as Elective-III in Third semester)

S.No	Course Code	Name of the Course
1.	17PIT3EA	Software Project Management
2.	17PIT3EB	Embedded Systems
3.	17PIT3EC	Management Control Information System

Earning Extra credits is not mandatory for programme completion

Extra credits

Part	Subject	Credit	Total credits
1.	Publication with ISSN Journal	1	1
2.	Hindi /Other Foreign language	1	1
3.	Paper Presented in Sponsored National/ International Seminar/conference/ workshop	1	1
4.	Online Courses Prescribed By Department / Self study paper	1	1
5.	Representation - Academic/Sports /Social Activities/ Extra Curricular Activities at University/ District/ State/ National/ International	1	1
	Total	5	5

Rules:

The students can earn extra credits only if they complete the above during the Programme period (I to III semester) and based on the following criteria. Proof of Completion must be submitted in the office of the Controller of Examinations before the commencement of the IV Semester. (Earning Extra credits are not mandatory for programme completion)

1. Publication with ISSN Journal by a student and co-authored by staff member will be given one credit extra.
2. Student can opt Hindi/ French/ Other foreign Language approved by certified Institutions to earn one credit. The

certificate (Hindi) must be obtained from Dakshina Bharat Hindi Prachar Sabha and He/ she has to enroll and complete during their Programme period (first to third semester)

Award winners in Paper Presentation in Sponsored International Seminar/conference/Participation in short term workshop (minimum 5 days) will be given one credit extra.

3. Student can earn one credit, if they complete any one Online certification courses / Self study course prescribed by the concerned department.

Self study course offered by the PG and Research Department of Computer Science

S. No.	Semester	Course Code	Course Title
1.	III	17PITSS1	M -Commerce
2.		17PITSS2	Management Information System

4. Award Winners in /Social Activities/ Extra Curricular /Co-Curricular Activities / Representation in Sports at University/ District/ State/ National/ International level can earn one extra credit.

PROGRAMME OUTCOMES

On the successful completion of the programme, students will be able to

PO No.	Programme Outcome Statement
PO1	The ability to identify and analyze the requirements of Information Technology.
PO2	The understanding of professional and ethical responsibility in the field of Information Technology and to communicate effectively.
PO3	The capability to implement algorithms and paradigms with modern software tools.
PO4	The ability to function effectively on multi-disciplinary projects and problems.
PO5	The skill to recognize and respond towards research areas of Information Technology and the need for lifelong learning.

17PIT13A	CORE - I: ADVANCED JAVA	SEMESTER - I
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PREAMBLE:-

It focuses on Graphical User Interface (GUI), multithreading, networking, and Database manipulation

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Java Fundamentals	K2
2.	To learn about Methods and Classes	K2
3.	To know about Collections and AWT	K3
4.	To learn about Java Servlets and Java Server Pages	K4
5.	Understanding the Remote Method Invocation	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	M	M	S	M
CO3	S	S	S	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT13A	CORE - I: ADVANCED JAVA	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Java Fundamentals-Data types -Operators -Control Statements-Classes and objects.

UNIT - II

Methods and Classes -Inheritance -Packages -Interfaces -Exceptional Handling.

UNIT - III

Collections-File and Streams -Networking -Event Handling -AWT: Windows, Controls, Layout Managers and Menus -Swing -JDBC.

UNIT - IV

Java Servlets: Design -Life Cycle-cookies -Session tracking-Java Server Pages: Overview -Implicit Objects -Scripting -Standard Actions-Directives.

UNIT - V

Remote Method Invocation: Remote Interface -Naming Class -RMI Security Manager Class -RMI Exceptions -Creating RMI Client and Server Classes.

TEXT BOOKS:

1. *Herbert Schildt, "The Complete Reference - JAVA 2",* Seventh Edition, 2006.
Chapters: 1-10, 17, 19, 20, 22-24, 29, 31.
2. *Deitel & Deitel , "Java How to Program" ,* Pearson Education ,Seventh Edition,2008. Chapters: 18,20,24,25

REFERENCE BOOKS:

1. *Muthu*, "**Programming with Java**", Vijay Nicole Imprints Private Ltd., 2004.
2. *Deitel H.M. & Deital P.J*, "**Java How to Program**", Prentice-Hall of India, Fifth Edition, 2003.
3. *Cay.S. Horstmann, Gary Cornel*, "**Core Java 2 - Vol. II- Advanced Features**", Pearson Education, 2004.
4. *Tom Valsky*, "**Enterprise JavaBeans - Developing component based Distributed Applications**", Pearson Education, 1999.

17PIT13B	CORE - II: OPEN SOURCE TECHNOLOGY	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- Introduction to Linux, UNIX Network Programming
- An overview of PHP and also it helps in understanding PHP as a powerful server-side scripting language for creating dynamic and interactive websites and to gain knowledge on Perl, MySQL Programming.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about Linux	K2
2.	To learn about Viewing Text	K2
3.	To learn about UNIX Network Programming and Elementary sockets	K2
4.	To learn about PHP Programming Basics and Arrays	K4
5.	To learn about Perl Programming and File Management	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	S	M	M	M	M
CO3	S	S	M	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	M

S - Strong; M - Medium; L - Low.

17PIT13B	CORE - II: OPEN SOURCE TECHNOLOGY	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Introduction to Linux – What every Linux users knows- The shell-The X windows system –Files and Directories.

UNIT - II

Viewing Text – Editing Text – Pattern matching, VI, Ex and Vim editors.

UNIT - III

UNIX Network Programming-Introduction to TCP/IP: Introduction – The Transport Layer TCP and UDP. **Elementary sockets:** Sockets Introduction, Elementary TCP sockets – I/O multiplexing – Socket options.

UNIT - IV

PHP Programming Basics: PHP - Introduction, PHP Basics: - Syntax- Variables- Controls and functions passing information between pages - Strings. Arrays: - Using Arrays, Manipulating Arrays, Associative Arrays.

UNIT - V

Perl Programming Perl - Introduction, Perl Basics: - Syntax, Variables, Strings, Numbers, Operators, and Arrays: - Using Arrays, Manipulating Arrays, Associative Arrays, and Chop, Length, and Sub string. Hashes, Arguments, Logic, Looping, Files, Pattern Matching, Environment Variables, Using cgi-lib for Forms. File Management PERL: - File Handling, Reading from Files, Appending Files, Writing to Files, File Checking, Reading Directories. Databases PERL: - DBI Module, DBI

Connect, DBI Query, MySQL Module, MySQL Connect, MySQL SelectDB, MySQL Query

TEXT BOOKS:

- *Ellen sivever, Aarom weber, Stephen Figgins, Robers Love and Arnold Robbins*
- *O'Reilly, **Linux Ina Nutshell - A desktop Quick Reference**, [Fifth Edition.*
- *Michael Stutz, 2004. **Linux CookBook**, [Second Edition], SPD Pvt.ltd.*
- *Elizabeth Naramore et al, 2006. **Beginning PHP5, Apache, MySQL Web Development**, Wiley dream tech publishing, Chris Ullman Press Ltd Publications.*

17PIT13C	CORE- III: CLOUD COMPUTING	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To understand the Cloud Computing
- To enable learner to use various Cloud computing concepts

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the cloud computing	K2
2.	To learn about Data Storage in the Cloud	K2
3.	To know about General Security Advantages of Cloud-Based Solutions	K3
4.	To know about Managing the Cloud	K4
5.	To learn about Designing Cloud Based Solutions	K5

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	M	M	S	M
CO3	S	M	M	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	S

S – Strong; M - Medium; L - Low.

17PIT13C	CORE- III: CLOUD COMPUTING	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Introducing cloud computing- Web 2.0 and the Cloud- Distinguishing Cloud Types- Exploring Uses of the Cloud - Introducing Scalability - Introducing Virtualization - Collecting Processing Power Through Grid Computing. Software as a Service (SaaS)- Understanding the Multitenant Nature of SaaS Solution - Understanding OpenSaaS Solution - Understanding Service-Oriented Architecture (SOA). Platform as a Service (PaaS) - IT Evolution Leading to the Cloud - Benefits of PaaS Solutions - Disadvantages of PaaS Solutions. Infrastructure as a Service (IaaS) - Understanding IaaS - Improving Performance Through Load Balancing - System and Storage Redundancy - Utilizing Cloud-Based NAS Devices - Advantages of IaaS Solution - Server Types Within an IaaS Solution.

UNIT - II

Data Storage in the Cloud - Examining the Evolution of Network Storage - Understanding Cloud Based Data Storage - Advantages and Disadvantages of Cloud-Based Data Storage -Cloud-Based Backup Systems - Industry Specific Cloud-Based Data Storage - Cloud-Based Database Solutions - Cloud-Based Block Storage. Collaboration in the Cloud - Web-Based Collaboration - Cloud-Based Phone and Fax Systems - Revisiting File Sharing - Collaborating Via Web Logs - Collaborative Meeting in the Cloud - Virtual Presentations and Lectures - Using Social Media for Collaboration - Using Cloud-Based Calendar Management - Using Streaming Video Content to Collaborate. Virtualization -

Leveraging Blade Servers - Server Virtualization - Desktop Virtualization
- Desktop Solutions on Virtualization - Virtual Networks - Data Storage
Virtualization - Not All Applications Are Well Suited for Virtualization.

UNIT - III

General Security Advantages of Cloud-Based Solutions - Introducing
Business Continuity and Disaster. Disaster Recovery and Business
Continuity and the Cloud - Understanding the Threats - Understanding
Service Level Agreements - Disaster Recovery Plan Template. Service-
Oriented Architecture - Web Services Are Not Web Pages -
Understanding Web Services Performance - Web Service and Reuse -
Scaling Web Services - Web Services and Loose Coupling - Treating a
Web Service as a Black Box - Web Service Interoperability - Governing
Web Services.

UNIT - IV

Managing the Cloud - Know Your Service-Level Agreement - Ensure and
Audit Systems Backups - Know Your System's Data Flow - Determine
Technical Support and Help Desk Procedures - Determine Technical
Support and Help Desk Procedures - Determine Training Procedures -
Know the Provider's Security Policies and Procedures - Monitor Audit-
Log Use. Migrating to the Cloud - Define the System Goals and
Requirements - Protect Your Existing Data - Use an Experienced Cloud
Consultant - Know Your Application's Current Characteristics - Define
Your Training Requirements - Establish a Realistic Development
Schedule - Review the Budget IT Factors - Understanding Cloud
Bursting.

UNIT - V

Designing Cloud Based Solutions - Revisit the System Requirements -
Design Is a Give-and-Take Process. Coding Cloud-Based Applications -

Creating a Mashup Using Yahoo! Pipes - Using Google App Engine. The Future of the Cloud - How the Cloud Will Change Operating Systems - Location-Aware Applications - Intelligent Fabrics, Paints, and More - The Future of Cloud TV - Future of Cloud-Based Smart Devices - Cloud and Mobile - Faster Time to Market for Software Applications - Home-Based Cloud Computing.

TEXT BOOK:

1. *Kris Jamsa, **Cloud Computing***, Jones & Bartlett Learning, 2014.

REFERENCE BOOK:

1. *Anthony T.Velte, Toby J. Velte, Robert Elsenpeter, **Cloud Computing***
- A Practical Approach, McGraw Hill Education, 2013.

17PIT13D	CORE - IV : DISTRIBUTED OPERATING SYSTEM	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To gain more knowledge about advanced operating system principles, explore new ideas and research possibilities in future operating systems design.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about Distributed Operating Systems	K2
2.	Understanding the Remote Procedure calls	K2
3.	To know about Distributed shared memory	K3
4.	Understanding the Synchronization	K4
5.	To make out Case Studies	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	M	M	S	M
CO3	M	S	M	M	S
CO4	S	M	S	M	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT13D	CORE - IV : DISTRIBUTED OPERATING SYSTEM	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Distributed Operating Systems - Distributed computing system models- Issues in designing a distributed OS. Message passing - Synchronization - Buffering - failure handling.

UNIT - II

Remote Procedure calls - The RPC model - Transparency of RPC - Implementing RPC - Stub generation and RPC messages - Marshalling arguments & results - Server management and parameter passing semantics- Communication protocols for RPC - Client Server binding - Lightweight RPC.

UNIT - III

Distributed shared memory - General architecture - Design and Implementation issues-Granularity - Structure of shared memory space - Consistency models - Replacement strategy-Thrashing.

UNIT - IV

Synchronization - Mutual exclusion - Deadlock - Election algorithms. Process management-Process migration. Distributed file systems - Features - File models - File sharing semantics -File caching schemes - File replication - Fault tolerance.

UNIT - V

Case Studies: Amoeba - Design goals & main features - System Architecture- Objects and their management - Process management - File Management - Inter process communication.

TEXT BOOKS:

1. *Pradeep K Sinha*, 2012. **Distributed Operating Systems Concepts and Design**, Prentice Hall of India Pvt. Ltd (Unit I - Unit V)
2. *D M Dhamdhare*, 2012. **Operating Systems**, Tata McGraw-Hill Publishing Company Limited.

17PIT13P	CORE PRACTICAL - I: ADVANCED JAVA	SEMESTER - I
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Total Credits: 2
Hours Per Week: 5

PREAMBLE:

1. To learn and develop Programs using JAVA Language.
2. To Learn and Implement Servlets, JDBC and RMI Concepts.

LAB LIST

1. Implementation of Multi threading and Exception handling concepts
2. Implementation of I/O Streams
3. Programs in AWT, Swing and Event handling
4. Network Programming
5. Programs using JDBC.
6. Implementing Servlets / JSP
7. RMI
8. Implementation of Client Server.

17PIT13Q	CORE PRACTICAL - II: OPEN SOURCE TECHNOLOGY	SEMESTER - I
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Total Credits: 2
Hours Per Week: 5

PREAMBLE:

1. Practical knowledge of PHP and various methods to implement rich internet applications using PHP.

LAB LIST

1. Write a Shell script to print given numbers sum of all digits.
2. Write a Shell script to print contains of file from given line number to next given number of lines
3. Simple PHP program using variables and control structures.
4. PHP loops.
5. PHP arrays.
6. Passing variables between pages.
7. Creating a table and inserting records to table in MySQL.
8. Deleting and updating in MySQL table.
9. Connecting PHP to MySQL database.
10. Viewing MySQL table data through PHP.
11. Manipulating MySQL database through PHP.
12. Validating user login through PHP.
13. Write a program to upload a file in PHP.
14. Create a Pay slip for an employee using PHP and MySQL.
15. Create a program for String Manipulation in PERL.
16. Create a program for Environment Variables in PERL.
17. Reading a data from a file and write the data to another file using PERL

17PIT23A	CORE -V : INTERNET PROGRAMMING	SEMESTER - II
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Total Credits: 4
Hours Per week: 4

PREAMBLE:

- To Learn the Basics of XHTML and CSS and their implementation.
- To Focus on the Concepts of JavaScript, ASP and Ajax

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about Internet and XHTML	K2
2.	To learn about Java Script and Functions	K2
3.	To know about Java Script Arrays and Objects	K3
4.	To learn about XML and RSS	K4
5.	To learn about Ajax	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	M	M	S	M
CO3	S	M	M	M	S
CO4	S	S	S	M	M
CO5	M	M	S	M	S

S - Strong; M - Medium; L - Low.

17PIT23A	CORE -V : INTERNET PROGRAMMING	SEMESTER - II
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Total Credits: 4
Hours Per week: 4

UNIT - I

Introduction to computers and the Internet: history of the World Wide Web -Hardware trends -software trends -Web Resources. **Introduction to XHTML:** Introduction -markup language -editing XHTML -common tags -headers -text styling-linking-images-special characters-tables-forms-CSS-inline styles-embedded style sheets -linking external style sheets-backgrounds-user style sheets.

UNIT - II

Java Script -Introduction to scripting-simple program -obtaining user input with prompt dialogs-decision making-Java script control structures: If, if / else selection structure while, for do/while repetition structure - Logical Operators-**Java Script Functions:** Introduction -Program Modules in Java Script -Functions -Scope Rules -Recursion -Recursion Vs Iteration -Java Script Global Functions.

UNIT - III

Java Script Arrays: Introduction -Arrays -Declaring and Allocating Arrays -Reference Parameters -Passing Arrays to functions -Sorting Arrays -searching Arrays -Multiple Subscripted Arrays-**Java Script Objects:** Introduction -Math String, Data, Boolean and Number Objects-JavaScript events :Registering event handler-event onload -Event on mouse move, the event object and this-Form processing with onfocus and onblur-more events.

UNIT - IV

XML and RSS: Introduction -XML Basics-Structuring data-XML Namespaces-Document Type definitions -XML Schema documents-XML Vocabularies -MathML -Other markup Languages-Extensible style sheet Language and XSL Transformations-Document Object Model-RSS Web Resources.

UNIT - V

Ajax Enabled Rich Internet Applications-Introduction -Traditional web applications vs Ajax applications -RIAs with Ajax-history of Ajax-Raw Ajax Example -Creating a full scale Ajax Enabled application-Active Server Pages (ASP): Introduction -How ASP Work -Client -Side Scripting Versus Server Side Scripting -Web Server -Activex Components -File System Objects Session Tracking and cookies - Accessing a Database form an ASP.

TEXT BOOKS:

1. *Deitel, Deitel, Nieto, "Internet and World Wide Web - How to program"*, Fourth Edition-Pearson Education Asia, 2011.
2. *Thomas A. Powell, "The Complete Reference HTML and XHTML"*, fourth Edition, Tata McGraw Hill Pub.

17PIT23B	CORE - VI : PROGRAMMING IN C# AND .NET FRAMEWORK	SEMESTER - II
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Total Credits: 4
Hours Per week: 4

PREAMBLE:

1. To Understand the trends and principles of .Net framework
2. To Gain problem solving skills using C#.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about .NET frame work	K2
2.	To learn about C#	K2
3.	To know about Operators	K3
4.	To know about Structures	K4
5.	To Know about Operator overloading	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	M	M	M	M
CO3	S	S	M	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	M

S - Strong; M - Medium; L - Low.

17PIT23B	CORE - VI : PROGRAMMING IN C# AND .NET FRAMEWORK	SEMESTER - II
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Total Credits: 4
Hours Per week: 4

UNIT - I

Introduction to .NET frame work - . NET objects - ASP .NET - .NET Web services - Windows forms.

UNIT - II

Introduction to C# - Characteristics of C# - Applications of C#- Understanding C# in .NET - .NET Framework- Common Language Runtime- Framework base classes-.NET Languages-Benefits of .NET approach -Overview of C# - Literals, variables and data types.

UNIT - III

Operators- Expressions-Decision Making and branching- Decision Making and looping - Methods in C#- Handling Arrays- Manipulating Strings

UNIT - IV

Structures- Struct with methods- Nested structures- difference between classes and structs- Enumerations-Classes and Objects- Inheritance and Polymorphism-Multiple Inheritances

UNIT - V

Operator overloading- Delegates and Events- Managing console I/O operations-Managing Errors and Exceptions.

TEXT BOOKS:

1. *Balagurusamy.E*, 2010. **Programming in C# - A Primer**, Tata McGraw-Hill.
2. *Christian Nagel, Bill Evjen*, 2010. **Professional C# 4 and .Net 4**, Wiley India Pvt.Ltd.
3. *Andrew Stellman, Jennifer Greene*, 2013. **Head First C#**, [Third Edition], O'Reily.

17PIT23C	CORE - VII : ADVANCED RDBMS	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- Basic understanding of the concepts, techniques, and applications of the database management technology
- Students will have the hands-on experience to use an existing database management system to develop a database application system.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about Database system architectures, Advanced Querying and Information Retrieval system.	K2
2.	Understanding the Storage and File Structure, Indexing and Hashing	K3
3.	To know about Transactions and Recovery System	K3
4.	To learn about Parallel Databases and Distributed Databases	K4
5.	To learn about Advanced Application Development and Transaction Processing	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	M	M	S	M
CO3	S	S	S	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT23C	CORE - VII : ADVANCED RDBMS	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Database system architectures: Centralized systems - Client/Server systems - Parallel and Distributed systems. Advanced Querying and Information Retrieval: Decision-support systems - Data mining - Data warehousing - Information Retrieval system: Relevance ranking using Terms - Relevance using Hyperlinks - Directories.

UNIT - II

Storage and File Structure: File Organization - Organization of Records in Files - Data Dictionary storage - Database Buffer. Indexing and Hashing: Basic concepts - Ordered Indices- Static Hashing - Dynamic Hashing.

UNIT - III

Transactions: Concept - A simple Transaction Model - Storage structure - Transaction Atomicity and Durability - Transaction Isolation - Serializability - Transaction Isolation and Atomicity. Recovery System: Failure Classification - Storage - Recovery and Atomicity Recovery Algorithm - Buffer Management - Failure with loss of Non-volatile storage.

UNIT - IV

Parallel Databases: I/O Parallelism - Inter query Parallelism - Intra query Parallelism - Interoperation Parallelism - Interoperation Parallelism - Design of Parallel Systems. Distributed Databases: Homogeneous and Heterogeneous Databases - Distributed Data Storage - Distributed

Transactions – Commit Protocols – Concurrency control in Distributed database – Availability – Distributed Query Processing.

UNIT - V

Advanced Application Development: Performance Tuning. Advanced Transaction Processing: Transaction Processing Monitors – Transactional Workflows – Main Memory Databases – Real-time Transaction System – Long-Duration Transactions.

TEXT BOOKS:

1. *Abraham Silberchatz, Henry F.Korth, S.Sudharshan, 2011. Database System Concepts*, [Fifth Edition], McGraw Hill. (Unit I – Unit V)
2. *Kevin Loney, George Koch, 2008. ORACLE 9i-The Complete Reference*, Tata McGraw Hill.

17PIT23D	CORE - VIII : NETWORK SECURITY	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To know the concepts and trends in Network security
- To understand the Working of Different Security Algorithms.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about Network Security	K2
2.	To learn about Symmetric key algorithms	K2
3.	To know about overview of Symmetric key Cryptography	K3
4.	To learn about Internet Security Protocols	K4
5.	To know about WAP Security	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	M	M	M	M	M
CO3	M	S	S	S	S
CO4	S	M	M	S	S
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT23D	CORE - VIII : NETWORK SECURITY	SEMESTER - II
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**Total Credits: 4
Hours Per Week: 4**

UNIT - I

Need for Network Security -Security Approaches -Principles of Security
-Types of Attacks - Cryptography concepts & Techniques: Plain text & Cipher text -Substitution Techniques -Transposition Techniques - Encryption & Decryption -Symmetric & Asymmetric key cryptography - Steganography.

UNIT - II

Symmetric key algorithms: Algorithm types & modes -Overview of Symmetric key -Cryptography -Data Encryption Standard .

UNIT - III

IDEA -RC5 -Advanced Encryption Standard Overview and History of symmetric key Cryptography -RSA algorithm -Digital Signatures - Knapsack Algorithm

UNIT - IV

Digital Certificates -Private Key management Internet Security Protocols: Basic concepts -SSL -TLS-SHTTP.

UNIT - V

TSP -SET -Electronic money -Email Security -WAP Security - Security in 3G-Security in GSM-User authentication & Kerberos: Authentication basics - Passwords -Authentication Tokens -Certificate based authentication - Biometric authentication -Kerberos.

TEXT BOOK:

1. *Cryptography & Network Security*, **Atul Kahate** , TMH -2008 Second Edition

REFERENCE BOOKS:

1. *Cryptography & Network Security Principles of Practices* , **William Stallings**, PHI -4thEdition -2006
2. *Cryptography & Network Security* , **Forouzan** , TMH -Special Indian Edition -2007

17PIT23P	CORE PRACTICAL - III: INTERNET PROGRAMMING	SEMESTER - II
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Total Credits: 2
Hours Per Week: 5

PREAMBLE:

- To learn the concepts of website designing.
- To learn client& server side programming and web services.

LAB LIST

1. Web page creation using XHTML
 - i) To embed an image map in a web page
 - ii) To fix the hot spots
 - iii) Show all the related information when the hot spots are clicked.
2. Web page creation with all types of cascading style sheets
3. Programs for Implementing JavaScript using Operators and Functions
4. Programs for Implementing JavaScript using Arrays
5. Programs using XML-schema-XSLT/XSL
6. Programs using AJAX
7. Programs for Implementing Client side and Server side Scripting in ASP.
8. Programs in java to create three-tier applications using ASP and Databases
 - i) For conducting online examination
 - ii) For displaying students mark list.

17PIT23Q	CORE PRACTICAL - IV: PROGRAMMING IN C# AND .NET FRAMEWORK	SEMESTER - II
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Total Credits: 2
Hours Per Week: 5

PREAMBLE:

- To Understand the trends and principles of .Net Framework
- To Gain problem solving skills using C#.

LAB LIST

1. Write a program to display Floyd's Triangle.
2. Write a program to implement all types of method parameters.
3. Write a program to implement array list methods.
4. Write a program to implement array and string methods.
5. Write a program to overload binary operators and comparison operator.
6. Delegates and Event using Inheritance.
7. Write a program to display student's details using structures.
8. Write a program to find factorial and prime number using windows form application.
9. Design a registration page using the validate controls.
10. Design a web site that makes use of Master Pages

17PIT23V	CORE PROJECT I :PROJECT AND VIVA VOCE	SEMESTER - II
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Total Credits: 4

OBJECTIVE:

On successful completion of the project the students are:

1. Enable to enhance their skills for the software development.

PROJECT AND VIVA VOCE

Major Project

Each Student in the M.Sc IT Final Year must compulsorily undergo Project work in the 4th SEMESTER.

Projects shall be done on Individual Basis. The Project Coordinator will allocate the project title and the Guide for each student. The Project Work Should be done Inside the College.

Three Project Reviews will be conducted in which the Progress of Project work will be strictly evaluated by Respective Project Guide and Project Coordinator. Viva Voce will be conducted only in the presence of Industrialists or Academicians.

In the total of 150 Marks, 60% of marks are allocated for CIA and 90% for ESE Viva Voce.

Course Inputs:

- Project is an integral and important component in the last semester (4th semester) and passing the M.Sc Project is mandatory for all students.
- Project is basically meant for the implementation of the various technologies learned during the three semesters in the real life scenario.

Following guidelines are hereby enlisted for all the students based on the necessity and importance of the project

Basic framework

The stages in Project Work are given below:

- The student has to select a project in a related field of Computer Science / Information Technology.
- Students can opt various types of organizations for their major project. But before the training actually starts, profile of the organization must be submitted for evaluating the various parameters of the company like *Turnover of the organization, No. of employees and Location of the organization(Major Project Only)*
- *If Mini Project the students should do the project in Lab Hours Only .(The Students can get data from an organization but only develop the project in the College lab Hours only)*
- After obtaining the approval from project guide, the student has to carry out the project work.

Student has to maintain the **project work diary**. The Project Work carried out should be in accordance with the approved project proposal

- All communication must be in writing. No verbal communication will be accepted.
- Student should adhere to the timings for submission of various reports as mentioned in the guidelines. No excuse will be entertained in any case.
- Student should prepare a Project Report at the end of his/her work, which his /her supervisor would certify and approve for submission (the Project Report should conform to the Standard Format laid down for Project Report).
- The student should submit the Project Report to the college.

Guide for the Project:

- Project guide will be allotted by the department to each student
- Each student will be working under a Project Guide for the project to be done.
- Student must report to his/her project guide regularly.

The student can also have a guide who could be the person under whose supervision the student is doing the project in the industry

Selection of Project:

- The selection of the project can be done in consultation with the project guide.
- The maximum number of students who can join one company for training is **one per location**. (Major Project Only)
- No student will change organization and change the project topic during the training period. (Major Project Only)
- Group of the students are not allowed to do a single project at a time.

It is possible that a group of student is doing different modules of the same project. In such cases, the student is required to do 3-5 modules of the large project

Submission of project report.

- The student will submit his/her project report in the prescribed format.
- Project Report will be submitted in triplicate (Hard Bound Copies) with the proper certification by the organization concerned in the specified format and color. None of copies of the project report will be returned to the student.

- The project reports along with a CD should be submitted to the HoD/Supervisor / Controller of examinations twenty days prior to the final semester examination.

A certificate from the supervisor should also be enclosed in the Project Report as provided in the format for project report.

Fields for Project:

- **GUI Tools (Front End)** - Visual Basic, Power Builder, X-Windows (X/lib, X/motif, X/Intrinsic), Oracle Developer 2000, VC++, Jbuilder
- **RDBMS(Back End)** - Oracle, Ingres, Sybase, Progress, SQL Plus, Versant, MY SQL, SQL Server, DB2
- **Languages** - C, C++, Java, VC++, C#
- **Scripting Languages** - PERL, SHELL Scripts (Unix), Tcl/TK, PHP
- **.NET Platform** - Dyalog APL, VB.Net, C#.Net, Visual C#.Net, Net, ASP.Net, Delphi
- **Middle Ware (Component) Technologies** - COM/DCOM, Active-X, EJB, WINCE, MSMQ, BEA, Message Q, MTS, CICS
- **Unix Internals** - Device Drivers, RPC, Threads, Socket programming
- **Architectural Concepts** - CORBA, TUXEDO, MQ SERIES
- **Internet Technologies** - DHTML, Java script, VB Script, Perl & CGI script, HTML, Java, Active X, RMI, CORBA, SWING, JSP, ASP, XML, EJB, Java Beans, Servlets, Visual Age for JAVA, UML, VRML, WML, Vignette, EDA, Broad vision, Ariba, iPlanet, ATG, Big Talk, CSS, XSL, Oracle ASP server, AWT, J2EE, LDAP, ColdFusion, Haskell 98
- **Wireless Technologies** - Blue Tooth, 3G, ISDN, EDGE

- **Real time Operating System/ Embedded Skills** - QNX, LINUX, OSEK, DSP, VRTX, RTXC, Nucleus
- **Operating Systems** - WINDOWS 2000/ME, WINDOWS NT, WINDOWS XP, UNIX, LINUX, IRIX, SUN SOLARIS, HP/UX, PSOS, VxWorks, AS400, AIX, DOS
- **Application Areas** - Financial / Insurance / Manufacturing / Multimedia / Computer Graphics / Instructional Design/ Database Management System/ Internet / Intranet / Computer Networking-Communication Software development/ E-Commerce/ ERP/ MRP/ TCP-IP programming / Routing protocols programming/ Socket programming.

NOTE:

- Projects should not be developed using the packages like Dbase III Dbase IV, FoxPro, Visual FoxPro, CYBASE and MS-Access. Also, projects should not be developed using the combination of Visual Basic as the front end and MS-Access as the back end.**

Students can also develop applications using tools/languages/software not listed above, if they are part of latest technologies

Phases of Training Period

- At the time of Review - I, students should present Title, Synopsis/Abstract of the project and module description.
- Students should present the Mid Term Report at the time of Review - II.
- Students should present the Development and Testing Report at the time of Review - III.
- Students should submit the complete Project Report at the time of Model Viva-Voce./

The external Viva-Voce will be conducted for all the students.

Formatting of Project:

- The whole project report should be nicely composed and presented.
- The dimension of the project report should be in A4 size only.
- Page Specification : (Written paper and source code)

Left margin - 3.0 cms/1.18 inches

Right margin- 2.0 cms/0.78 inches

Top margin 2.54 cms/1 inch

Bottom margin 2.54 cms/1 inch

- The project report should be typed in good word processor and should avoid spellings and grammatical mistakes.
- The impression on the typed copies should be black in color.

Normal Body Text: Font Size: 12, Times New Roman, 1.5 lines Spacing, Justified.

Paragraph Heading Font Size: 14, Times New Roman, Left Aligned. 12 points above & below spacing.

Chapter Heading Font Size: 16, Times New Roman, Centre Aligned, 30 points above and below spacing.

Coding Font size: 10, Courier New, Normal

- Students should use only one side of paper for printing.
- Page numbers - All text pages as well as Program source code listing should be numbered at the bottom center of the page.

Cover Page - Attractive and appealing cover page containing the Project Title, program details, Student & Guide details, month of submission etc.

COLOR - Cover Page Color is silver Gray

Letter of Authentication - To be submitted by students declaring that the Project Report is the original work of student and no reward had been

attained for same project ever before. Students are advised not to **COPY** the project report from other students.

Authorization from Organization where such Project have been implemented with certificate showing the student name, register number and project name.

Certificate from Project Guide - Certificate from the Project Guide certifying the project work done under his/her guidance along with course, student, and project details complete in all respects.

Draft of Project Report

The size of the project report can be approximately **130 - 150** pages, which include the following details:

Certificate of the project guide

Certificate of the Organization

Acknowledgement

Synopsis / Abstract

Table of Contents

1 Introduction

1.1 About Organization

1.2 Problem Definition

1.3 System Configuration

1.3.1 Hardware configuration

1.3.2 Software configuration

2 System Study

2.1 Existing System with limitations

2.2 Proposed System with objectives

2.3 Problem description

3 System Design & Development

3.1 System Flow Diagrams / Control Flow Diagrams

3.2 E-R Diagrams / Use Case Diagrams

3.3 Data Flow Diagram / Activity Diagrams

3.4 Input Design

3.5 File / Database Design

3.6 Output design (includes Report Design)

3.7 User Interface Design (if Needed)

4 System Testing

Unit Testing

Integration Testing

System Testing

5 System Implementation and Maintenance

System Security Measures

6 Conclusion

Scope for Future Prospects

Bibliography and Web References

Appendices

Forms (input screen shots)

Sample Source Code

Output Screen shots

Reports

Sample Coding / Abstract Coding

- Along with it, if the student feels to add on any other topics as per the demand of the project or want to include the functionalities as per the SDLC(Software Development Life Cycle) or the Software Engineering model used, that can be done and included in the Project Report.

The project report must include all the components as per the SDLC. It is highly recommended to follow the approaches of Software Engineering methodology.

Arrangement of Contents

- Cover Page & Title Page
- Bonafide Certificate
- Synopsis / Abstract
- Table of Contents
- Chapters
- List of Tables
- List of Figures
- List of Symbols, Abbreviations and Nomenclature
- Appendices
- References

The table and figures shall be introduced in the appropriate places

- **List of Symbols, Abbreviations and Nomenclature** - One and a half spacing should be adopted for typing the matter under this head. Standard symbols, abbreviations etc. should be used.
- **Chapters** - The chapters may be broadly divided into 3 parts. Introductory chapter, Chapters developing the main theme of the project work and Conclusion.

The main text will be divided into several chapters and each chapter may be further divided into several divisions and sub-divisions.

- ❖ Each chapter should be given an appropriate title.
- ❖ Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.

- ❖ Footnotes should be used sparingly. They should be typed with single space and placed directly underneath in the very same page, which refers to the material they annotate.
- **Appendices** - Appendices are provided to give supplementary information, which is included in the main text as they may serve as a distraction and cloud the central theme.
 - ❖ Appendices should be numbered using Arabic numerals.
 - ❖ Appendices, Tables and References appearing in appendices should be numbered and referred to an appropriate place just as in the case of chapters.
 - ❖ Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.
- **List of References** -The listing of references should be typed 4 spaces below the heading "REFERENCES" in alphabetical order in single spacing and left justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.

A typical illustrative list given below relates to the citation example quoted above.

17PIT33A	CORE IX : MOBILE OPERATING SYSTEM	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

It focuses on building the skills necessary to perform android programming and development.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Android Fundamentals	K2
2.	To learn about Android Applications	K2
3.	To know about Android User Interface Design Essentials	K3
4.	To learn about Using Common Android APIs	K3
5.	Understanding the Mobile Software Development	K3

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	M	M	S	S	M
CO3	S	S	M	M	S
CO4	S	M	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT33A	CORE IX : MOBILE OPERATING SYSTEM	SEMESTER - III
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**Total Credits: 4
Hours Per Week: 4**

OBJECTIVES:

1. To introduce basic concepts of Android Programming.
2. To introduce Building Mobile Application using Android.

UNIT - I

Introduction to Android History of Mobile Software Development - The Open Handset Alliance - The Android Platform - Android SDK - Building a sample Android application. **Android Application Design Essentials:** Anatomy of an Android applications - Android terminologies - Application Context, Activities, Services, Intents.

UNIT - II

Android Application Design Essentials: Receiving and Broadcasting Intents - Android Manifest File and its common settings - Using Intent Filter, Permissions - Managing Application resources in a hierarchy - Working with different types of resources

UNIT - III

Android User Interface Design Essentials: User Interface Screen elements - Designing User Interfaces with Layouts - Drawing and Working with Animation

UNIT - IV

Using Common Android APIs: Using Android Data and Storage APIs - Managing data using SQ Lite - Sharing Data between Applications with Content Providers - Using Android Networking APIs - Using Android Web APIs - Using Android Telephony APIs

UNIT - V

Deploying Android Application to the World: The Mobile Software Development Process - Testing Android Applications - Selling your Android application.

TEXT BOOK:

1. *Lauren Darcey and Shane Conder*, 2011. **Android Wireless Application Development**, [Second Edition], Pearson Education.

REFERENCE BOOKS:

1. *Reto Meier*, 2011. **Professional Android 2 Application Development**, Wiley India Pvt Ltd.
2. *Mark L Murphy*, 2009. **Beginning Android**, Wiley India Pvt Ltd.
3. *Sayed Y Hashimi and Satya Komatineni*, 2009. **Pro Android**, Wiley India Pvt Ltd.
4. **Chapter wise Coverage from Text Book: Chapters:**
1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 29

Note: In Practical, Eclipse Mobile edition will be allowed to be used as an IDE.

17PIT33B	CORE X: SOFTWARE TESTING	SEMESTER - III
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Total Credits: 4

Hours Per Week: 4

PREAMBLE:

It focuses on building the skills necessary to perform software testing at the function, class and application level.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Software Testing Fundamentals	K2
2.	To learn about concepts and techniques for black-box and white-box testing and path testing.	K2
3.	To know about Data flow testing, Syntax Testing	K3
4.	To learn about the State Graphs and transition Testing	K4
5.	Understanding the types of testing	K5

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	M	M	S	M
CO3	S	S	S	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT33B	CORE X: SOFTWARE TESTING	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

1. To understand the concepts of Software testing.
2. To get the skill of software testing.

UNIT - I

Purpose of Software testing - Some Dichotomies - a model for testing - Playing pool and consulting oracles - Is complete testing possible -The Consequence of bugs - Taxonomy of Bugs

UNIT - II

Software testing Fundamentals - Test case Design -Introduction of Black Box Testing and White Box testing - Flow Graphs and Path testing - Path testing Basics - Predicates, Path Predicates and Achievable Paths - Path Sensitizing - Path Instrumentation - Implementation and Application of Path Testing.

UNIT - III

Transaction Flow testing - Transaction Flows - techniques - Implementation Comments - Data Flow Testing - Basics - Strategies - Applications, Tools and effectiveness - Syntax Testing - Why, What, How - Grammar for formats - Implementation - Tips.

UNIT - IV

Logic Based Testing - Motivational Overview - Decision tables - Path Expressions - KV Charts - Specifications - States, State Graphs and transition Testing - State Graphs - Good & bad states - state testing Metrics and Complexity

UNIT - V

Testing GUIs - Testing Client - Server Architecture - Testing for Real-time System - A Strategic Approach to Software testing - issues - unit testing - Integration Testing - Validation testing - System testing - The art of Debugging.

TEXT BOOKS:

1. *Boris Beizer*, 2003. **Software Testing Techniques**, Dreamtech Press, [Second Edition].
2. *Myers and Glenford.J.*, 1979. **The Art of Software Testing**, John-Wiley & Sons.

Roger.S.Pressman, 2001. **Software Engineering - A Practitioner's Approach** ,Mc-Graw Hill, [Fifth Edition].

17PIT33C	CORE XI : BIG DATA ANALYTICS	SEMESTER III
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

It focuses on building the skills necessary to perform Big data and introduces the technology.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Characteristics of Big Data	K2
2.	To learn about Application Development in Hadoop	K2
3.	To know about Analytical Databases	K3
4.	To learn about Futures of Big Data	K3
5.	Understanding the Big Data Analytics in industry sectors	K3

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	M	M	S	S	M
CO3	S	S	S	M	S
CO4	S	S	M	S	M
CO5	S	S	M	M	S

S - Strong; M - Medium; L - Low.

17PIT33C	CORE XI : BIG DATA ANALYTICS	SEMESTER III
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Total Credits: 4

Hours Per Week: 4

OBJECTIVES:

1. Overview about Big data and introduces the technology behind it.
2. Recent technologies available in the market dealing with big data.

UNIT - I

Big Data: Characteristics of Big Data- The volume of Data- the Variety- the Velocity of Data-Data in the Warehouse and Data in Hadoop. Why Data is Important? - When to consider a Big Data Solution- Big Data Use cases: Patterns for Big Data Deployment- IT for IT Log Analytics.

UNIT - II

Big Data: From the Technology Perspective-All about Hadoop: The Big Data Lingo Chapter-The history of Hadoop- Components of Hadoop- Application Development in Hadoop-Getting your data into Hadoop- Other Hadoop Components.

UNIT - III

Just Hadoop- Integrated Hadoop System- Analytical Databases with Hadoop Connectivity-Hadoop-Centered Companies. Big Data in the Cloud: IaaS and Private Clouds-Platform Solutions-Big Data Cloud platforms compared.

UNIT - IV

The No SQL Movement: Size, Response, Availability-Changing Data and Cheap Launches-The sacred Cows-other features. The Future of Big Data:

More Powerful and expressive tools for Analysis- Streaming Data Processing- Rise of Data Marketplaces- Development of Data Science Workflows and Tools- Increased Understanding of and Demand for Visualization.

UNIT - V

Big Data Analytics in Banking Sector, Manufacturing, Telecommunication and E-commerce.

TEXT BOOKS

1. *Chris Eaton, Dirk Deroos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data, Analytics for Enterprise Class Hadoop and Streaming Data"*, Tata Mc Graw Hill,. Edition. (E-book) (Unit-I and II) (Refer e-book repository), 2012.
2. *O'Reilly Radar Team, "Planning for Big Data"*, (eBook) (Unit III and IV) (Refer eBook repository). 2012.

17PIT33D	CORE - XII : CYBER SECURITY	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

It focuses on the Basics of Cyber Security, its Security Policies and Cyber management issues

COURSE OUTCOME

CO .No	CO. Statement	Knowledge Level
1.	To Understand Cyber security Principles, measures and challenges.	K2
2.	To understand about the cybeoffenses	K3
3.	To Demonstrate attacks Mobile and Wireless Devices.	K4
4.	To Understand various attacks and Phishing.	K3
5.	To Study Governments various security Policies	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	S	S	M	M
CO3	S	M	S	M	S
CO4	M	M	M	S	M
CO5	S	S	S	M	M

S - Strong; M - Medium; L - Low.

17PIT33D	CORE - XII : CYBER SECURITY	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

1. To Learn the Basics of Cyber Security.
2. To Know the Security Policies and cyber management issues.

UNIT-I

Introduction: Cybercrime definition and origins of the world,-Cybercrime and information security-Cyber criminals- Classifications of cybercrime- Cybercrime : The Legal Perspective-Cybercrime : An Indian Perspective

UNIT-II

Cyberoffenses :Introduction - How criminal plan the attacks, Social Engineering- Cyber stalking, Cybercafe and Cybercrimes- Attack vector- Cloud computing

UNIT-III

Cybercrime : Introduction - Proliferation of Mobile and Wireless Devices-Trends in Mobility-Credit Card Frauds in Mobile and Wireless Computing Era-Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices- Authentication Service Security- Attacks on Mobile/Cell Phones-Mobile Devices: Security Implications for Organizations- Organizational Measures for Handling Mobile- Devices-Related Security Issues- Organizational Security Policies and Measures in Mobile Computing Era- Laptops

UNIT-IV

Tools and Methods used in Cybercrime : Proxy Servers and Anonymizers- Phishing, Password Cracking, Keyloggers and Spywares - Virus and Worms- Trojan Horses and Backdoors - Steganography - DoS DDoS Attacks- Attacks on Wireless Networks

UNIT-V

Cybercrimes and Cybersecurity: The Legal Perspectives : Introduction - Cybercrime and the Legal Landscape around the world - Why do we need Cyberlaws: The Indian Context - The Indian IT Act - Challenges to Indian Law and Cybercrime Scenario in India - Digital Signature and the Indian IT Act

TEXT BOOKS:

1. *Nina Godbole, Sunit Belapure, "Cyber Security"* Wiley India Pvt Ltd, New Delhi, 2011

REFERENCE BOOKS:

1. *Rick Howard, "Cyber Security Essentials"*, Auerbach Publications, 2011.
2. *Richard A, Clarke and Robert Knake, "Cyber war: The Next Threat to National Security & What to Do About It"*, Ecco, 2010.
3. *Dan Shoemaker, "Cyber security The Essential Body Of Knowledge"*, 1st ed. Cengage Learning, 2011.

17PIT33P	PRACTICAL V: MOBILE APPLICATION DEVELOPMENT LAB	SEMESTER - III
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Total Credits: 2
Hours Per Week: 5

PREAMBLE:

1. The main objectives to give hands on experience in Mobile Application Development using Android by introducing basic concepts of Android Programming.
2. Building Mobile Application in Android and to introduce cutting edge technology to the students.

LAB LIST

- 1) Create "Hello World" application. That will display "Hello World" in the middle of the screen in the red color with white background.
- 2) To understand Activity, Intent
 - a. Create sample application with login module. (Check username and password)
 - b. On successful login, go to next screen. And on failing login, alert user using Toast.
 - c. Also pass username to next screen.
- 3) Create login application where you will have to validate Email ID (User Name). Till the username and password is not validated, login button should remain disabled.
- 4) Create and Login application as above. On successful login, open browser with any URL.
- 5) Create an application that will pass some number to the next screen and on the next screen that number of items should be display in the list.
- 6) Understand Menu option. : Create an application that will change color of the screen, based on selected options from the menu.

- 7) Create an application that will display toast (Message) on specific interval of time.
- 8) Create a background application that will open activity on specific time.
- 9) Create an application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.
- 10) Understanding content providers and permissions:
 - a. Read phonebook contacts using content providers and display in list.

17PIT33Q	PRACTICAL VI: SOFTWARE TESTING LAB	SEMESTER - III
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Total Credits: 2
Hours Per Week: 5

PREAMBLE:

Various S/W testing can be done related to the methods given below using any of the s/w testing tools.

LAB LIST

1. Design Phase testing
2. Program Phase Testing.
3. Debugging
4. Evaluation of test results
5. Installation phase testing & Acceptance testing

17PIT43V	CORE PROJECT II :PROJECT AND VIVA VOCE	SEMESTER - IV
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Total Credits: 14

OBJECTIVE:

On successful completion of the project the students are:

2. Enable to enhance their skills for the software development.

PROJECT AND VIVA VOCE

Major Project

Each Student in the M.Sc IT Final Year must compulsorily undergo Project work in the 4th SEMESTER.

Projects shall be done on Individual Basis. The Project Coordinator will allocate the project title and the Guide for each student. The Project Work Should be done Inside the College.

Three Project Reviews will be conducted in which the Progress of Project work will be strictly evaluated by Respective Project Guide and Project Coordinator. Viva Voce will be conducted only in the presence of Industrialists or Academicians.

In the total of 150 Marks, 60% of marks are allocated for CIA and 90% for ESE Viva Voce.

Course Inputs:

- Project is an integral and important component in the last semester (4th semester) and passing the M.Sc Project is mandatory for all students.
- Project is basically meant for the implementation of the various technologies learned during the three semesters in the real life scenario.

Following guidelines are hereby enlisted for all the students based on the necessity and importance of the project

Basic framework

The stages in Project Work are given below:

- The student has to select a project in a related field of Computer Science / Information Technology.
- Students can opt various types of organizations for their major project. But before the training actually starts, profile of the organization must be submitted for evaluating the various parameters of the company like *Turnover of the organization, No. of employees and Location of the organization*(Major Project Only)
- *If Mini Project the students should do the project in Lab Hours Only .(The Students can get data from an organization but only develop the project in the College lab Hours only)*
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Student has to maintain the **project work diary**. The Project Work carried out should be in accordance with the approved project proposal

- All communication must be in writing. No verbal communication will be accepted.
- Student should adhere to the timings for submission of various reports as mentioned in the guidelines. No excuse will be entertained in any case.
- Student should prepare a Project Report at the end of his/her work, which his /her supervisor would certify and approve for submission (the Project Report should conform to the Standard Format laid down for Project Report).
- The student should submit the Project Report to the college.

Guide for the Project:

- Project guide will be allotted by the department to each student

- Each student will be working under a Project Guide for the project to be done.
- Student must report to his/her project guide regularly.

The student can also have a guide who could be the person under whose supervision the student is doing the project in the industry

Selection of Project:

- The selection of the project can be done in consultation with the project guide.
- The maximum number of students who can join one company for training is **one per location**. (Major Project Only)
- No student will change organization and change the project topic during the training period. (Major Project Only)
- Group of the students are not allowed to do a single project at a time.

It is possible that a group of student is doing different modules of the same project. In such cases, the student is required to do 3-5 modules of the large project

Submission of project report.

- The student will submit his/her project report in the prescribed format.
- Project Report will be submitted in triplicate (Hard Bound Copies) with the proper certification by the organization concerned in the specified format and color. None of copies of the project report will be returned to the student.
- The project reports along with a CD should be submitted to the HoD/Supervisor / Controller of examinations twenty days prior to the final semester examination.

A certificate from the supervisor should also be enclosed in the Project Report as provided in the format for project report.

Fields for Project:

- **GUI Tools (Front End)** - Visual Basic, Power Builder, X-Windows (X/lib, X/motif, X/Intrinsic), Oracle Developer 2000, VC++, Jbuilder
- **RDBMS(Back End)** - Oracle, Ingres, Sybase, Progress, SQL Plus, Versant, MY SQL, SQL Server, DB2
- **Languages** - C, C++, Java, VC++, C#
- **Scripting Languages** - PERL, SHELL Scripts (Unix), Tcl/TK, PHP
- **.NET Platform** - Dyalog APL, VB.Net, C#.Net, Visual C#.Net, Net, ASP.Net, Delphi
- **Middle Ware (Component) Technologies** - COM/DCOM, Active-X, EJB, WINCE, MSMQ, BEA, Message Q, MTS, CICS
- **Unix Internals** - Device Drivers, RPC, Threads, Socket programming
- **Architectural Concepts** - CORBA, TUXEDO, MQ SERIES
- **Internet Technologies** - DHTML, Java script, VB Script, Perl & CGI script, HTML, Java, Active X, RMI, CORBA, SWING, JSP, ASP, XML, EJB, Java Beans, Servlets, Visual Age for JAVA, UML, VRML, WML, Vignette, EDA, Broad vision, Ariba, iPlanet, ATG, Big Talk, CSS, XSL, Oracle ASP server, AWT, J2EE, LDAP, ColdFusion, Haskell 98
- **Wireless Technologies** - Blue Tooth, 3G, ISDN, EDGE
- **Real time Operating System/ Embedded Skills** - QNX, LINUX, OSEK, DSP, VRTX, RTXC, Nucleus

- **Operating Systems** - WINDOWS 2000/ME, WINDOWS NT, WINDOWS XP, UNIX, LINUX, IRIX, SUN SOLARIS, HP/UX, PSOS, VxWorks, AS400, AIX, DOS
- **Application Areas** - Financial / Insurance / Manufacturing / Multimedia / Computer Graphics / Instructional Design/ Database Management System/ Internet / Intranet / Computer Networking-Communication Software development/ E-Commerce/ ERP/ MRP/ TCP-IP programming / Routing protocols programming/ Socket programming.

NOTE:

- ii. **Projects should not be developed using the packages like Dbase III Dbase IV, FoxPro, Visual FoxPro, CYBASE and MS-Access. Also, projects should not be developed using the combination of Visual Basic as the front end and MS-Access as the back end.**

Students can also develop applications using tools/languages/software not listed above, if they are part of latest technologies

Phases of Training Period

- At the time of Review - I, students should present Title, Synopsis/Abstract of the project and module description.
- Students should present the Mid Term Report at the time of Review - II.
- Students should present the Development and Testing Report at the time of Review - III.
- Students should submit the complete Project Report at the time of Model Viva-Voce./

The external Viva-Voce will be conducted for all the students.

Formatting of Project:

- The whole project report should be nicely composed and presented.
- The dimension of the project report should be in A4 size only.
- Page Specification : (Written paper and source code)
 - Left margin - 3.0 cms/1.18 inches*
 - Right margin- 2.0 cms/0.78 inches*
 - Top margin 2.54 cms/1 inch*
 - Bottom margin 2.54 cms/1 inch*
- The project report should be typed in good word processor and should avoid spellings and grammatical mistakes.
- The impression on the typed copies should be black in color.
 - Normal Body Text: Font Size:** 12, Times New Roman, 1.5 lines Spacing, Justified.
 - Paragraph Heading Font Size:** 14, Times New Roman, Left Aligned. 12 points above & below spacing.
 - Chapter Heading Font Size:** 16, Times New Roman, Centre Aligned, 30 points above and below spacing.
 - Coding Font size:** 10, Courier New, Normal
- Students should use only one side of paper for printing.
- Page numbers - All text pages as well as Program source code listing should be numbered at the bottom center of the page.

Cover Page - Attractive and appealing cover page containing the Project Title, program details, Student & Guide details, month of submission etc.

COLOR - Cover Page Color is silver Gray

Letter of Authentication - To be submitted by students declaring that the Project Report is the original work of student and no reward had been attained for same project ever before. Students are advised not to **COPY** the project report from other students.

Authorization from Organization where such Project have been implemented with certificate showing the student name, register number and project name.

Certificate from Project Guide - Certificate from the Project Guide certifying the project work done under his/her guidance along with course, student, and project details complete in all respects.

Draft of Project Report

The size of the project report can be approximately **130 - 150** pages, which include the following details:

Certificate of the project guide

Certificate of the Organization

Acknowledgement

Synopsis / Abstract

Table of Contents

1 Introduction

1.4 About Organization

1.5 Problem Definition

1.6 System Configuration

1.3.1 Hardware configuration

1.3.3 Software configuration

2 System Study

2.1 Existing System with limitations

2.2 Proposed System with objectives

2.3 Problem description

3 System Design & Development

3.1 System Flow Diagrams / Control Flow Diagrams

3.2 E-R Diagrams / Use Case Diagrams

3.3 Data Flow Diagram / Activity Diagrams

3.4 Input Design

3.5 File / Database Design

3.6 Output design (includes Report Design)

3.7 User Interface Design (if Needed)

4 System Testing

Unit Testing

Integration Testing

System Testing

5 System Implementation and Maintenance

System Security Measures

6 Conclusion

Scope for Future Prospects

Bibliography and Web References

Appendices

Forms (input screen shots)

Sample Source Code

Output Screen shots

Reports

Sample Coding / Abstract Coding

- Along with it, if the student feels to add on any other topics as per the demand of the project or want to include the functionalities as per the SDLC(Software Development Life Cycle) or the Software Engineering model used, that can be done and included in the Project Report.

The project report must include all the components as per the SDLC. It is highly recommended to follow the approaches of Software Engineering methodology.

Arrangement of Contents

- Cover Page & Title Page
- Bonafide Certificate
- Synopsis / Abstract
- Table of Contents
- Chapters
- List of Tables
- List of Figures
- List of Symbols, Abbreviations and Nomenclature
- Appendices
- References

The table and figures shall be introduced in the appropriate places

- **List of Symbols, Abbreviations and Nomenclature** – One and a half spacing should be adopted for typing the matter under this head. Standard symbols, abbreviations etc. should be used.
- **Chapters** – The chapters may be broadly divided into 3 parts. Introductory chapter, Chapters developing the main theme of the project work and Conclusion.

The main text will be divided into several chapters and each chapter may be further divided into several divisions and sub-divisions.

- ❖ Each chapter should be given an appropriate title.
- ❖ Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.
- ❖ Footnotes should be used sparingly. They should be typed with single space and placed directly underneath in the very same page, which refers to the material they annotate.

- **Appendices** – Appendices are provided to give supplementary information, which is included in the main text as they may serve as a distraction and cloud the central theme.
 - ❖ Appendices should be numbered using Arabic numerals.
 - ❖ Appendices, Tables and References appearing in appendices should be numbered and referred to an appropriate place just as in the case of chapters.
 - ❖ Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.
- **List of References** –The listing of references should be typed 4 spaces below the heading “REFERENCES” in alphabetical order in single spacing and left justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.

A typical illustrative list given below relates to the citation example quoted above.

17PIT1EA	ELECTIVE - I : INTERNET OF THINGS	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To Know about IoT concepts, IoT technologies, Creative thinking techniques, Co-creation techniques.
- To focus on the possibilities offered by the different technologies, and the creative thinking techniques to find innovative applications of combinations of various technologies in real-life scenarios.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To know about Internet of Things	K2
2.	To learn about Domain Specific IoTs	K2
3.	To Know about IoT Platforms Design Methodology	K3
4.	To learn about IoT Physical Devices and Endpoints	K4
5.	To learn about case study for IoT design	K52

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	M
CO2	S	S	S	S	S
CO3	S	M	S	M	S
CO4	M	M	M	S	M
CO5	M	S	S	M	M

S - Strong; M - Medium; L - Low.

17PIT1EA	ELECTIVE - I : INTERNET OF THINGS	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Introduction to Internet of Things : Introduction-Physical Design of IoT- Logical Design of IoT-IoT Enabled Technologies-IoT Levels and Deployment Templates. IoT and M2M: Introduction-M2M-Difference between IoT and M2M-SDN and NFV for IoT.

UNIT - II

Domain Specific IoTs:Introduction-Home Automation-Cities-Environment-Energy-Retail-Logistics-Agriculture-Industry-Health and Lifestyle. IoT System Management: Need for IoT System Management-SNMP-Network Operator Requirements.

UNIT - III

IoT Platforms Design Methodology: Introduction-IoT Design Methodology-Case Study on IoT System for Weather Monitoring - Motivation for Using Python. IoT Systems-Logical Design using Python: Introduction- Installing Python-Python Data Types and Data Structures- Control Flow-Functions-Modules-Packages-File Handling-Date/Time Operations-Classes-Python Packages of Interest for IoT.

UNIT - IV

IoT Physical Devices and Endpoints:IoT Device-Exemplary Device:Raspberry Pi-About the Board-Linux on Raspberry Pi-Raspberry Pi Interfaces-Programming Raspberry Pi with Python-Other IoT Devices. IoT Physical Servers and Cloud Offerings: Introduction to Cloud Storage Models and Communication APIs-WAMP-AutoBahn for IoT-Xively

Cloud for IoT-Python Web Application Framework-Django-Designing a RESTful Web API-Amazon Web Services for IoT- SkyNet IoT Messaging Platform.

UNIT - V

Case Studies Illustrating IoT Design: Introduction-Home Automation-Cities-Environment-Agriculture-Productivity Applications. Data Analytics for IoT: Introduction-Apache Hadoop-Using Hadoop Map Reduce for Batch Data Analysis-Apache Oozie-Apache Spark-Apache Storm-Using Apache Storm for Real-Time data Analysis

TEXT BOOK:

1. *Arshdeep Bahga, Vijay Madisetti, Internet of Things-A Hands-on Approach*, University Press,2015

REFERENCE BOOK:

1. *Ian G.Smith, The Internet of Things2012 New Horizons*, IREC-Internet of Things European Research Cluster, 2012.

17PIT1EB	ELECTIVE - I : PRINCIPLES OF PROGRAMMING LANGUAGES	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To understand and describe syntax and semantics of programming languages
- To understand data, data types, and basic statements, object-orientation, concurrency, and event handling in programming languages

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about Language Design Issues and Language Translation Issues	K2
2.	To learn about Modeling Language Properties	K2
3.	Understanding the Encapsulation	K3
4.	To know about Functional and Logic Programming	K4
5.	To learn about Formal Semantics	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	M
CO2	S	S	S	S	S
CO3	S	M	M	M	M
CO4	M	M	M	M	M
CO5	M	S	S	M	M

S – Strong; M - Medium; L - Low.

17PIT1EB	ELECTIVE - I : PRINCIPLES OF PROGRAMMING LANGUAGES	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Language Design Issues: History-Role of Programming languages - Programming environments - Impact of machine Architectures - Language Translation Issues: Programming language Syntax- Stages in Translation - formal Translation models - recursive descent Parsing.

UNIT - II

Modeling Language Properties: Formal Properties of Languages- Language Semantics-Elementary data Types: Properties of Types and Object- Scalar Data Types - Composite Data Types.

UNIT - III

Encapsulation: Structured data types - Abstract data types - Encapsulation by sub programs Type Definitions Inheritance: - Polymorphisms.

UNIT - IV

Functional Programming: Programs as Functions- Functional Programming in an Imperative Language - LISP - Functional Programming with static typing - delayed evaluation- Mathematical functional programming- recursive functions and lambda calculus - Logic programming : Logic and Logic Programs - Horn Clauses - Prolog - Problems with logic programming.

UNIT - V

Formal Semantics: Sample small language - operational Semantics - Denotation Semantics - Axiomatic Semantics - Program correctness - Parallel Programming: Parallel Processing and programming languages - threads - Semaphore - monitors-message passing - parallelism Non Imperative Languages

TEXT BOOKS:

1. *Terrence W Pratt, Marvin V Zelkowitz and Tadepalli V Gopal*, „**Programming Languages - Design and Implementation**“, PHI Publications, 4th edition, 2013.
2. *Nansi Shi*, „**Mobile Commerce Applications**“, Idea Group Publishing, 2004.

17PIT1EC	ELECTIVE - I: ADVANCED SOFTWARE ENGINEERING	SEMESTER - I
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To Focus on software process, process models, Agile development, requirement analysis, planning
- To learn about function oriented design, OO design, detailed design and coding.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about software engineering and Process models.	K2
2.	To learn about Agile development and requirements	K3
3.	To know about Software requirements analysis and specification,	K3
4.	Understanding Function oriented design and Object Oriented Design	K4
5.	To learn about Detailed design and coding	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	M	M	M	M
CO3	S	S	S	M	S
CO4	S	M	M	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT1EC	ELECTIVE - I: ADVANCED SOFTWARE ENGINEERING	SEMESTER - I
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Total Credits:

4

Hours Per Week: 4

UNIT - I

Software and software engineering: Nature of the software-Nature of Heaps -Software engineering-Software process-Software myths. Process models: Generic process model-Process assessment and improvement-Prescriptive process model-Specialized process model-Process technology.

UNIT - II

Agile development: Agility-Agile process-Extreme programming - SCRUM-A tool set for the agile process. A Case Study on Agile Project Development. Understanding requirements: Requirements engineering-Establishing the groundwork-Eliciting requirements-Developing use cases-Building the requirements model-Negotiating requirements-Validating requirements.

UNIT - III

Software requirements analysis and specification: Software requirements-Problem analysis- Requirements specification-Functional specification with use cases. Software architecture: Role of software architecture-Architecture views-Component and connector view- Planning a software project: Process planning-Effort estimation-Project scheduling and staffing-Software configuration management plan-Quality plan-Risk management-Project monitoring plan.

UNIT - IV

Function oriented design: Design principles-Module level concepts-Design notations and specification-Structured design methodology-Verification-Metrics. Object Oriented Design: OO Analysis and OO Design-OO concepts-Design concepts-Unified modeling language-Design methodology.

UNIT - V

Detailed design: Detailed design and PDL-Verification-Metrics. Coding: Programming principles and guidelines-Coding process-Refactoring-Verification-Metrics. A Case Study on Software Metrics in Open Source Software's

TEXT BOOK:

1. Software Engineering - A Practitioner's Approach, Roger S. Pressman, Seventh Edition, Tate McGraw Hill Higher Education, 2010.

REFERENCE BOOKS:

1. Integrated Approach to Software Engineering, Pankaj Jalote, Third Edition, Narosa Publishing House, Twenty Ninth Reprint, 2011.
2. Software Engineering, Ian Sommerville, Addison Wesley, Ninth Edition,

17PIT2EA	ELECTIVE- II: WIRELESS APPLICATION PROTOCOL	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To learn the Mobile Concepts.
- Wireless Markup Language and its Applications.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding Rise of Mobile Data	K2
2.	To learn about Wireless Markup Language	K2
3.	To know about Application Security and Errors and Browser Limitations	K3
4.	To know about User Interface Design	K4
5.	Understanding the Wireless Telephony Applications	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	M	M	S	M
CO3	M	S	S	M	S
CO4	S	M	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT2EA	ELECTIVE- II: WIRELESS APPLICATION PROTOCOL	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

UNIT - I

The Rise of Mobile Data - Market Convergence Enabling Convergence - Key Services for the Mobile Internet - Overview of the Wireless Application Protocol - The Origins of WAP -Overview of the WAP Architecture - Components of the WAP Standard - Network Infrastructure Services Supporting WAP Clients - WAP Architecture Design Principles -Relationship to Other Standards.

UNIT - II

The Wireless Markup Language - Overview - The WML Document Model - WML Authoring - URLs Identify Content - Markup Basics - WML - Basics - Basic Content -Events, Tasks and Bindings.

UNIT - III

Variables - Controls - Miscellaneous Markup - Sending Information - Application Security - Other Data - The Meta Element - Document Type Declarations - Errors and Browser Limitations - Content Generation - WML Version Negotiation.

UNIT - IV

User Interface Design - Making Wireless Applications - Easy to Use - Web Site Design -Computer Terminals Vs Mobile Terminals - Designing a Usable WAP Site - Structured Usability Methods - User Interface Design Guidelines - Design Guidelines for Selected WML Elements.

UNIT - V

Wireless Telephony Applications - Overview of the WTA Architecture - WTA Client Framework - WTA Server & Security - Design

Considerations - Application Creation Toolbox - Future WTA Enhancements. The Mobile Internet Future: Better Content, Easier Access - Beyond Browsing - Beyond Cellular - Mobile Data Unleashed.

TEXT BOOKS:

1. *Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Daniel Mauney, Jari Alvinen, David Bevis, Jim Chan, Stefan Hild, 2007. **The Wireless Application Protocol**, Pearson Education.*
2. *Sandeep Singal et al. 2001. **WAP writing applications for Mobile Internet**, Pearson Education*
3. **Data Bubrook**, 2001. *WAP: A beginner's guide*, Tata McGraw Hill.

17PIT2EB	ELECTIVE - II : ARTIFICIAL INTELLIGENCE AND ROBOTICS	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To understand the concept of AI like Heuristic, Hill Climbing, Planning, etc.,
- To gain knowledge about robotics and their applications

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	To learn about AI Problems	K2
2.	To know about Heuristic Search Techniques	K2
3.	Understanding the Knowledge Representation Issues and Applications of Robots	K3
4.	To learn about Fundamentals of Robotics	K4
5.	To know about Sensors and Applications of Robots	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	S
CO2	S	M	S	S	M
CO3	M	S	S	M	S
CO4	S	M	S	S	M
CO5	M	S	M	M	S

S - Strong; M - Medium; L - Low.

17PIT2EB	ELECTIVE - II : ARTIFICIAL INTELLIGENCE AND ROBOTICS	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

UNIT - I

The AI Problems - AI technique - Criteria for success - Define the Problem as a state space search - Production System - Characteristics - Problem Characteristics.

UNIT - II

Heuristic Search Techniques: Generate and Test - Hill climbing -Best First Search - Problem Reduction - Constraints Satisfaction - Means End Analysis.

UNIT - III

Knowledge Representation Issues: Approaches to knowledge Representation - The Frame Problem - Computable Functions & Predicates - Resolution - Procedural versus Declarative Knowledge.

UNIT - IV

Fundamentals of Robotics: Introduction, classification of Robots, History of Robots, Advantages and Disadvantages of Robot, Robot components, Robot degree of freedom, Robot joints and coordinates, Robot workspace, Robot reach, Robot languages.

UNIT - V

Sensors: Introduction to internal and external sensors of the robot, Position sensors, Velocity sensors, Acceleration sensors, SONAR and IR sensors, Touch and tactile sensors. Applications of Robots: Applications of robots, selection of robots, economic factors and justification for robotic application; safety requirements.

TEXT BOOKS:

1. *Elaine Rich and Kevin Knight*, 1991. **Artificial Intelligence**, [Second Edition], Tata McGraw Hill.
2. *Craig J J*, 2004. **Introduction to Robotics, Mechanics and Control**, Pearson Education, New Delhi.
3. *Saeed B Niku*, 2003. **Introduction to robotics**, Pearson Education, New Delhi.

17PIT2EC	ELECTIVE - II : MOBILE COMPUTING	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

- To understand the concept of wireless mobile computing.
- To understand World Wide Web and its applications.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Vertical and applications of Wireless Networking	K2
2.	To know about Space division multiplexing	K2
3.	To learn about Comparison of S/T/F/CDMA	K3
4.	Understanding the UMTS and IMT	K4
5.	To know about World Wide Web	K5

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	M	M	S	M
CO3	S	S	S	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT2EC	ELECTIVE - II : MOBILE COMPUTING	SEMESTER - II
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Total Credits: 4
Hours Per Week: 4

UNIT - I

Introduction - Vertical and applications of Wireless Networking - Positioning of Wireless networking relative to wired networks - Wireless LAN and Wireless WAN - Wireless PBXs map - The Radio Spectrum cell size and achievable throughput. Wireless transmission - Frequencies for radio transmission - Regulations - Signals, Antennas, Signal propagation, path loss of radio signals, Additional signal propagation effects- Multipath propagation - Multiplexing.

UNIT - II

Space division multiplexing - Frequency division multiplexing - time division multiplexing - Code division multiplexing. Spread spectrum - Direct sequence spread spectrum - Frequency hopping spread spectrum - Cellular systems. Medium access control - Hidden and exposed terminals - Near and far terminals - SDMA, FDMA, TDMA, Fixed TDM, Classical Aloha, slotted Aloha, Carrier sense multiple access- Reservation TDMA - Multiple access with collision avoidance - Polling - CDMA - Spread Aloha multiple access

UNIT - III

Comparison of S/T/F/CDMA.GSM - Mobile services - System architecture - Radio interface - Protocols - Localization and calling - Handover - Security - Location Management for Mobile Cellular Systems - GPRS - Mobile services - System Architecture.

UNIT - IV

UMTS and IMT - 2000.Wireless LAN - Infra red vs. radio transmission - Infrastructure and ad-hoc network - IEEE 802.11 - System architecture -

Protocol architecture - Physics layer - Medium access control layer - MAC management - Blue tooth. Mobile network layer - Mobile IP - Goals, assumptions and requirements - entities and terminology - packet delivery - Agent discovery - Registration - Tunneling and encapsulation
Recent technologies

UNIT - V

World Wide Web - WAP - Architecture - wireless datagram Protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML script - Mobile computing applications using J2ME.

TEXT BOOKS:

1. *John Schiller, 2003. **Mobile Communications**, Addison Wesley.*
2. *Rifaat A. Dayen, 1997. **Mobile Data & Wireless Lan Technologies**, Prentice Hall.*
3. *Steve Mann and Scoot Schibli, **The Wireless Application Protocol**, John Wiley & Sons, inc.*
4. *Steve Mann, 2000. **Programming Applications With The Wire Less Application Protocol**, John Wiley & Sons, Inc.*

17PIT3EA	ELECTIVE III : SOFTWARE PROJECT MANAGEMENT	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

PREAMBLE:

It focuses on building the skills necessary to perform the trends and principles of software project management.

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Software Product life cycle	K2
2.	To learn about Software configuration management	K2
3.	To know about Software coast Estimation	K3
4.	To learn about Software Design and development phase	K3
5.	Understanding the Software testing and maintenance	K3

Mapping with Programme Outcomes

Cos/Pos	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	M	S	S	S	M
CO3	S	M	M	M	S
CO4	S	S	M	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT3EA	ELECTIVE III : SOFTWARE PROJECT MANAGEMENT	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

OBJECTIVE:

1. To understand the trends and principles of software project management.

UNIT - I

Product life cycle: Introduction - idea generation - prototype development phase - alpha phase - beta phase - protection phase - Maintenance and obsolescence phase. Project Life cycle models - What is it? A framework for studying different life cycle models - waterfall model, prototype model, RAD model, spiral model. Matrices: Metric roadmap- metric strategy- why to measure- set target, track them, understand and minimize variability, Act on data- Common fit falls

UNIT - II

Software configuration management: Basic definitions and terminology- The process and activities of Software configuration audit - software configuration management in geographically distributed teams- metrics in software configuration management - tools and automation. Software quality assurance Defining quality, importance of quality, quality control and assurance - cost and benefits of quality - software quality analyst's functions, SQA tools, measures for SQA success- pitfalls. Risk management

UNIT - III

Requirement gathering; inputs and start criteria for requirements, dimensions for requirement gathering, steps, to be followed, output and quality records, skill sets Estimation – what is estimation, when and why is it needed, three phases of estimation – estimation methodology-models for size estimation-converting effort to schedule

UNIT - IV

Design and development phase: Some differences in chosen approach – salient features of design- evolving an architecture, blueprint- design for reusability- technology choices/ constraints – design standards – design for portability- user interface issues – design for testability – design for diagnosability-design for maintainability- designs for installability and interoperability

UNIT - V

Project management testing and maintenance: Testing– activities that make testing- test scheduling and types of tests – people issues in testing management structures for testing – metrics. Introduction to management phase- configuration management, skill sets, estimating size, effort, and people resources for maintenance and metrics

TEXT BOOKS:

1. *Gopalswamy Ramesh*,2005. **Managing Global software projects**, Tata McGraw Hill.
2. *Kelkar.S.A*, 2003. **Software project management** – a concise study, PHI.

17PIT3EB	ELECTIVE III : EMBEDDED SYSTEM	SEMESTER - III
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PREAMBLE:

To introduce the basic concepts of Embedded Systems and the various techniques used for Embedded Systems with real time examples.

COURSE OUTCOME:

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the use of processor s and memory	K2
2.	To learn about Device Drivers and Interrupts Servicing Mechanism	K2
3.	To know about single & Multiprocessor systems software	K3
4.	To learn about Inter-Process Communication and RTOS Concepts	K4
5.	Understanding the Software co-design in an embedded System	K5

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	M	M	S	M
CO3	S	S	S	M	S
CO4	S	S	S	S	M
CO5	M	M	M	M	S

S - Strong; M - Medium; L - Low.

17PIT3EB	ELECTIVE III : EMBEDDED SYSTEM	SEMESTER - III
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**Total Credits:4
Hours Per Week: 4**

OBJECTIVES:

1. To understand the RTOS concepts.
2. To understand the Embedded software Development

UNIT - I

Introduction to Embedded Systems: Embedded System – Processor in the system – Other hardware units – software embedded into a system – Exemplary Embedded systems – On chip and in VLSI Circuit. Processor and Memory selection for an embedded system.

UNIT - II

Devices and Buses for Device Networks: I/O devices – Timer and counting Devices. Device Drivers and Interrupts Servicing Mechanism: Device drivers – Parallel Port device drivers in a system – Serial Port device in a system – Device drivers for internal programmable timing devices – Interrupt servicing mechanism – context and the periods for context-switching, deadline and interrupt latency.

UNIT - III

Program modeling concepts in single & 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 for microprocessor systems.

UNIT - IV

Inter – process communication & 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 SYSTEM:- Real time and Embedded systems operating systems - Interrupt routines in RTOS environment - RTOS Task scheduling models, Interrupt latency and Response times of the Tasks as performance Metrics - performance Metric in scheduling models for periodic, sporadic and A periodic Tasks

UNIT - V

Hardware - Software co-design in an embedded System: Embedded System Project Management - Embedded system design and co-design issues in system development processes - Design cycle in the development phase for an Embedded system - Uses of Target system, or its Emulator and In-circuit Emulator - Use of software tools for development of an embedded system - Use of scopes and logic analysis for system hardware tests - Issues in Embedded system design.

TEXT BOOKS:

1. *Raj Kamal*, 2003. **Embedded Systems - Architecture, Programming and Design**, Tata Mcgraw - Hill.
2. *David E. Simon*, 2003. **An Embedded Software primer**, Pears on Education Asia.

17PIT3EC	ELECTIVE III: MANAGEMENT CONTROL INFORMATION SYSTEM	SEMESTER - III
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**Total Credits: 4
Hours Per Week: 4**

PREAMBLE:

It focuses on building the skills necessary to perform the importance and implementation of MIS for an organization

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO .No	CO. Statement	Knowledge Level
1.	Understanding the Information and Management	K2
2.	To learn about Basics of Management Information System	K2
3.	To know about Development Process of MIS	K3
4.	To learn about Applications of MIS various Sectors	K3
5.	Understanding the Information Life Cycle Management	K3

Mapping with Programme Outcomes

Cos/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	S	M	S	S	M
CO3	S	S	M	M	S
CO4	S	M	M	S	M
CO5	M	S	S	M	S

S - Strong; M - Medium; L - Low.

17PIT3EC	ELECTIVE III: MANAGEMENT CONTROL INFORMATION SYSTEM	SEMESTER - III
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Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

1. The basic concepts of MIS, importance of MIS for an organization and will be able to contribute effectively in the development.
2. Implementation of MIS in different types of organizations.

UNIT - I

Introduction to Information and Management: Definition of Information, Types of Information – Sources, Values and Control of Information – Implications of Information in Business & MIS Need for Information Systems – Examples of Information Systems – Impact of IT on organizations and society – Impact of IT on organizations and society – Impact of IT on organizations and society

UNIT - II

Basics of MIS : Decision-making – Process and Modeling – MIS and Decision-Making – Classification of Information, Methods of Data and Information Collection – Model of Human as Information Processor – Knowledge & Knowledge Management Systems – Knowledge & Knowledge Management Systems – Business Intelligence – System Concept & Control – Types of system, handling complexity of system – Efficiency and effectiveness, post implementation problems, classes of systems – General Model of MIS

UNIT - III

Developing MIS: Development Process of MIS – Implementation of MIS – Decision Support System – Group Decision Support System – Knowledge Based Expert Systems, Benefits of DSS

UNIT - IV

MIS in Functional Areas of Manufacturing & Service Sectors: Application of MIS in various Manufacturing Sectors – Personnel Management – Financial Management – Production Management – Raw Materials Management – Marketing Management – Introduction to Service Sector – Creating distinctive service – Service concept – Service process cycle and analysis – Customer service design – Service Management System – MIS Applications in Service Industry – MIS in Service Industry

UNIT - V

New Concepts in MIS : e-Business – Information Security – Computer Crime & Cyber terrorism – Computer Forensics – Information Life Cycle Management.

TEXT BOOKS:

1. *V. Rajaraman*, 2006. **Analysis and Design of Information Systems**, PHI Publication.
2. *Waman S. Jawadekar*, 2009. **Management Information Systems – Text & Cases**, [Fourth Edition], Tata McGraw-Hill Publication.
3. *Ken Laudon, Jane Laudon, Rajanish Dass*, 2010. **Management Information Systems Managing the Digital Firm**, [Eleventh Edition], Pearson Education.
4. Chapter wise Coverage from the Text Books:

5. Book # 1 : Chapter 1 & 2; Book # 2 : Chapter 5, 6, 7, 8.1 – 8.6, 9, 12, 13, 14; Book # 3 : Chapter 8

REFERENCE BOOKS:

1. *Robert G. Murdick, Joel E. Ross, James R. Claggett, 2005. **Information Systems for Modern Management**, [Third Edition], PHI Publication.*
2. *Stephen Haag, Maeve Cummings, Amy Philips, 2010. **Management Information Systems for the Information Age**, [Sixth Edition], McGraw-Hill Publication.*
3. *Sanjay Mohapatra, 2009. **Cases in Management Information Systems**, PHI Publication.*

17PITSS1	SELF STUDY PAPER-I : M - COMMERCE	SEMESTER: III
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Total Credits: 1

PREAMBLE

- To understand basics of Mobile Commerce.
- To understand about Mobile security and services.
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UNIT - I

Introduction: What is M-Commerce? - NTTDoCoMo's i-Mode Portal - Nordea's WAP Solo Mobile Banking Service - Webraska's SmartZone Platform -The Forces Behind the M-Commerce "Revolution" - Applications -and Services -What's So Special about M-Commerce?

UNIT - II

Mobile Communications: The Transition to 3G : Introduction -Mobile Communications: A Quick Primer -Historical Perspective -Basic Architecture -What Is So Special about Mobile -Communication? -Basic Multiplexing Schemes -Separating Uplink and Downlink Traffic -The 2G Landscape -A Closer Look at GSM -A Word about Roaming and Billing - Transition Toward 3G.

UNIT - III

Mobile Security and Payment: Introduction -Revisiting Security: The Role of Cryptography -Secret Key Cryptography -GSM's SIM-Based Authentication -Public Key Cryptography -Digital Signatures -Certificate Authorities -Combining Public and Secret Key Cryptography -Message Authentication Codes -The Combinations Are Many -Revisiting WAP Security and the Role of the WIM Module -Mobile Payment -Mobile

Payment Standardization Efforts -Different Mobile Payment Scenarios - MeT in Slow Motion.

UNIT - IV

Mobile Commerce Services Today: Introduction -Revisiting Mobile Portals -Voice Portals -Mobile Information Services -Mobile Directory Services -Mobile Banking and Trading -Mobile E-Tailing and E-Ticketing -Mobile Entertainment - Digital Bridges-Mobile Business Applications and Services

UNIT - V

Next-Generation M-Commerce: -Introduction -Next-Generation M-Commerce Scenarios -Personalization -3GPP's Personal Service Environment -Microsoft's .NET Passport -Location-Based Services -A Brief Overview of Competing Positioning Solutions -Handset-Based Positioning Solutions -Network-Based Positioning Solutions -A Fragmented Landscape -Signal Soft -Toward Context-Aware Services.

TEXT BOOK:

1. *Norman Sadeh, "M-Commerce Technologies, Services, and Business Models"*, Wiley Computer Publishing, 2003.

REFERENCE BOOKS:

1. *Brian Ernest Mennecke, "Mobile Commerce: Technology, Theory, and Applications"*,IRM Press,2003
2. *Paul May, "Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business"*, Cambridge University Press, 2001.
3. *Nansi Shi," Mobile Commerce Applications"*, Idea Group Publishing, 2004.

17PITSS2	SELF STUDY PAPER-II : MANAGEMENT	SEMESTER: III
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Total Credit : 1

PREAMBLE

- To understand basics of Management Information System
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UNIT - I

Introduction - environment of organizations - management information - system - information flow - need and sources - management decisions - importance and role.

UNIT - II

Characteristics of computer information system - importance of computer - role of the computer - types of computer - Software - Hardware - CPU - MU - Input - Output - application and operations

UNIT - III

System classification - concept characteristics - elements - feedback control - boundary - function and operations - system design - function of system analyst - assignment and investigation - implementation - evaluation and maintenance of MIS.

UNIT- IV

Transactions processing information systems - information systems for managers - intelligence system - decision support system - integration - data collection and preparation - database - components - utility of the operation of the data base technology.

UNIT-V

Functional Management information systems – production, marketing, accounting, personnel, financial, relationship – impact and their role in the managerial decision – making.

TEXT BOOK:

1. *CVS Murthy, “Management Information System”, Himalaya Pub. House-New Delhi, 2014.*
2. *Davis & Olson, “Management Information System”, Mc Graw Hill Pub.*

REFERENCE BOOKS:

1. *R. Senapathi, “Management Information System”, Lakshmi Publications.*
2. *Lucas, “The analysis, design and implementation of information system”, Mc Graw Hill Pub.*
3. *G.M. Scott, “Principles of management information system”, Mc Graw Hi*