



KONGU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

ERODE – 638 107

B.Sc (Information Technology)



KONGU ARTS AND SCIENCE COLLEGE

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2019-2020



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SYLLABUS

Sem	Course Code	Core 9 : Data Communications and Networks	Total Marks : 100		Hours Per Week	Credits
			CIA : 25	ESE: 75	6	4
V	17UAMCT501					

OBJECTIVE:

To enable the students to learn the various components in a data communication system, network protocols, architecture and applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1 Demonstrate the understanding of the basic terminology and concepts of the OSI and the Internet model.
- CO2 Explain the transmission media, multiplexing and telephone network.
- CO3 Illustrate the concepts of data link layer, data link control protocols and multiple access.
- CO4 Illustrate the concepts of network layer protocols and routing protocols.
- CO5 Demonstrate the detailed understanding of various protocols of the transport layer and applications of DNS and electronic mail.

UNIT - I

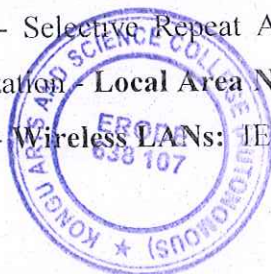
Introduction: Data Communications - Networks - The Internet - Protocols and Standards - **Network Models:** Layered Tasks - Internet Model - OSI Model.


UNIT - II

Physical Layer: Signals: Analog and Digital - Analog Signals - Digital Signals - **Digital Transmission:** Line Coding - Block Coding - Sampling - Transmission Mode - **Analog Transmission:** Modulation of Digital Data - Modulation of Analog Signals - **Multiplexing:** FDM - WDM - TDM - **Transmission Media:** Guided Media - Unguided Media: Wireless - **Circuit Switching and Telephone Network:** Circuit Switching - Telephone Network.

UNIT - III

Data Link Layer: Error Detection and Correction: Types of Errors - Detection - Error Correction - **Data Link Control and Protocols:** Flow and Error Control - Stop-and-Wait ARQ - Go-Back-N ARQ - Selective Repeat ARQ - **Multiple Access:** Random Access - Controlled Access - Channelization - **Local Area Networks: Ethernet:** Traditional Ethernet - Fast Ethernet - Gigabit Ethernet - **Wireless LANs:** IEEE 802.11.




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UNIT - IV

Network Layer: Internetworks - Addressing - Routing - **Network Layer Protocols:** ARP, IPv4, ICMP, IPv6 and ICMPv6: ARP - IP - ICMP - IPv6 - Unicast and Multicast Routing: Routing Protocols: Unicast Routing - Unicast Routing Protocols - Multicast Routing - Multicast Routing Protocols.

UNIT - V

Transport Layer: Process-to-Process Delivery - User Datagram Protocol (UDP) - Transmission Control Protocol (TCP) - **Congestion Control and Quality of Service:** Congestion - Congestion Control - Quality of Service - Techniques to Improve QoS - **Application Layer: Domain Name System (DNS):** Name Space - Domain Name Space - Distribution of Name Space - DNS in the Internet - Resolution - DNS Messages - **Electronic Mail (SMTP) and File Transfer (FTP):** Electronic Mail - File Transfer.

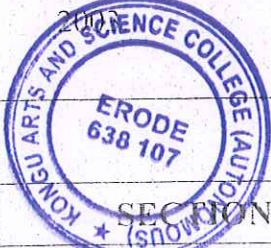
TEXTBOOK:

Behrouz A. Forouzan, Data Communications and Networking, Third Edition, Tata McGraw-Hill. Second Reprint, 2004.

BOOKS FOR REFERENCE:

1. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, Fifth Edition, Pearson, Second Impression, 2013.
2. Achyut S. Godbole, Data Communications and Networks, Tata McGraw-Hill, Twelfth Reprint, 2008.
3. Andrew S. Tanenbaum, Computer Networks, Fourth Edition, Pearson, Eighth Impression, 2011.
4. Larry L. Peterson, Bruce S. Davie, Computer Networks - a systems approach, Fifth Edition, Elsevier, First Indian Reprint, 2011.
5. Schaum's Outlines, Computer Networking, Tata McGraw-Hill Edition, Second Reprint.

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 <p>SECTION - A</p>	<p>Dr. N. RAMAN PRINCIPAL KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS) NANJANUR, ERODE - 638 107</p> <p>QUESTION PAPER PATTERN</p> <p>SECTION - B</p>	<p>SECTION - C</p>
<p>10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit</p>	<p>5 x 7 = 35 Marks (Either or choice) Two questions from each unit</p>	<p>3 x 10 = 30 Marks (Answer any three questions) One question from each unit</p>

Sem	Course Code	Elective - I - C: Programming in C#	Total Marks : 100		Hours Per Week	Credits
			CIA : 25	ESE: 75		
V	17UAMET507				5	4

OBJECTIVE:

To enable the students to learn the basic C# programming concepts.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Illustrate the basic concepts of C# programming.

CO2 Apply the concept of branching, looping, methods and arrays in C# programming.

CO3 Outline the importance of class, objects and inheritance.

CO4 Define the fundamentals of console I/O operations and exception mechanism.

CO5 Demonstrate the windows and web-based application development.

UNIT - I

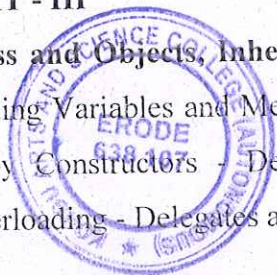
Introduction: What is C#? - Evolution of C# - Characteristics of C# - Applications of C# - C# differ from C++ and Java - The C# Environment - **Overview of C#:** Introduction - Simple C# program - Namespaces - Adding Commands - Command Line Arguments - Using Mathematical Functions - Compile Time Errors - Program Structure - Literals, **Variables and Data Types:** Introduction - Literals - Variables - Data Types - Reference Types - Declaration and Initialization of Variables - Default Values - Constant and Scope of Variables - Boxing and Unboxing.

UNIT - II

Decision Making and Branching: Simple if statement - if...else - Nesting of if... else Statements - else if Ladder - Switch Statement - ?: Operator - **Decision Making and Looping:** while statement - do Statement - for and foreach statement - Jumps in Loop - **Methods in C#:** Declaring Methods - Main Method - Invoking Methods - Pass by Value - Pass by Reference - Methods Overloading - **Arrays:** Introduction - One-Dimensional Arrays - Creating an Array - Two-Dimensional Arrays - Variable-size Arrays.

UNIT - III

Class and Objects, Inheritance: Introduction - Basic Principles of OOP - Defining a class - Adding Variables and Methods - Creating Objects - Accessing Class Members - Constructors - Copy Constructors - Destructors - Inheritance and Polymorphism - Interfaces - Operator Overloading - Delegates and Events.



UNIT - IV

Console I/O Operations and Exceptions: Introduction - Console Class - Console Input and Output - Formatted Output - **Managing Errors and Exceptions:** Types of Errors - Exceptions - Syntax of Exception Handling Code - Multiple Catch Statement - Exception Hierarchy - Using Finally Statement - Nested Try Blocks - Throwing Our Own Exceptions - **Multithreading in C#:** Creating and Starting a Thread - Scheduling a Thread - Synchronising Threads - Thread Pooling.

UNIT - V

Windows and Web-Based Application Development: Introduction - Understanding Microsoft Visual Studio - Creating and Running a WinApp Windows Application - Creating and Running a WinApp2 Windows Application - Web-based Application on .NET.

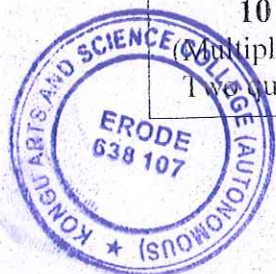
TEXTBOOK:

E.Balagurusamy, Programming in C# - A Primer, Second Edition, Tata McGraw Hill Publishing Company Limited, 2008.

BOOKS FOR REFERENCE:

1. Herbert Schildt, C# 2.0 - The Complete Reference, Second Edition, Tata McGraw Hill Publishing Company Limited, Seventh reprint 2008.
2. B.Rama Krishna Rao, Programming with C#-Concept and Practice, Prentice Hall of India, New Delhi, 2007.
3. Matt Telles, C# Programming- Black Book, Dreamtech Press, 2004.
4. Jesse Liberty, Learning C#, O' Reilly, First Edition, 2008.
5. Jon Skeet, C# in Depth, Dreamtech Press, 2008.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
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Sem	Course Code	Advanced Learners Course 2 - A: J2EE	Total Marks: 100		Hours Per Week	Credits
			CIA: -	ESE: 100		
V	17UAMAL509				-	2

OBJECTIVE:

To enable the students to learn about developing J2EE applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Describe the enterprise applications, building blocks and architecture.

CO2 Create dynamic java pages with servlets and JSP.

CO3 Demonstrate JDBC with SQL Databases and JNDI.

CO4 Implement the RMI mechanism and EJB techniques.

CO5 Illustrate the development of JMS and transactions with JTA/JTS.

UNIT - I

Defining the Enterprise: The architecture of an enterprise application - The building blocks of an enterprise application - Introducing J2EE - Downloading and installing J2EE - **Enterprise Applications:** Business-to-Consumer Applications - Business-to-Business Applications - Back-End Applications.

UNIT - II

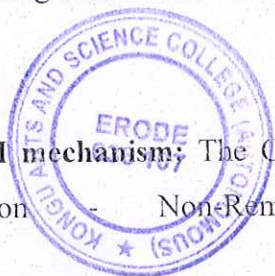
Creating Dynamic Content with Servlets: Creating a Basic HttpServlet - The Servlet APIs - Saving and Sharing information - Adding Functionality with filter(), forward() and include() - **JavaServer Pages:** Creating a Basic JSP Page - Putting the "J" in JSP - Adding Java Beans - Custom Tags - Bringing JSPs and Servlets Together.

UNIT - III

JDBC to Interact with SQL Databases: Java Abstractions of a Database - Connecting to a Database - Database Data Structures - Interacting with the Database - Enterprise Features - **Accessing Directory Services with JNDI:** Java Abstraction of Directory Services - Connecting to a Service - Interacting with Databases.

UNIT - IV

Exploring the RMI mechanism: The Components of a Basic RMI Application - Running distributed version - Non-Remote Objects - Activating Services



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Enterprise JavaBeans: Introducing a new level of abstraction - Exploring the components of an EJB service - Enterprise Beans on the server side - Enterprise Beans on the Client Side - **Advanced EJB Techniques:** Extending Enterprise Beans - Message-Driven Beans - Understanding Container-Managed Persistence - Managing Bean-Security Issues.

UNIT - V

JMS: Types of Messaging Systems - JMS Overview - JMS System Setup - Administered Objects - Sending and Receiving Messages - Application Development with JMS - JMS and J2EE - **Managing Transactions with JTA/JTS:** Java Transaction Service - Java Transaction API - How Do I Use JTA/JTS - ACME Widgets Inc.-A Shopping Cart Demo.

TEXTBOOK:

Justin Couch and Daniel H. Steinberg, J2EE Bible, WILEY dreamtech India Pvt. Ltd., First Edition 2002.

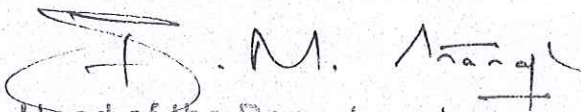
BOOKS FOR REFERENCE:

1. Pallavi Jain and Shadab Siddiqui with NIIT, J2EE Professional Projects, Prentice Hall of India Private Limited, 2002.
2. Java 6 and J2EE1.5 Black Book, Kognet Learning Solutions, Reprint 2011.
3. B V Kumar, S Sangeetha, S V Subrahmanya, J2EE Architecture, Tata McGraw- Hill Edition, The McGraw-Hill Companies, 2007.
4. Pankaj Kumar, J2EE Security for Servlets, EJBs and Web Services, Prentice Hall Professional, 2004
5. Bond Martin Law Debbie Longshaw Andy & Et Al, Teach Yourself J2EE in 21 Days, Pearson Education India, 2007

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
10 x 2 = 20 Marks 10 questions out of 12	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3 x 15 = 45 Marks (Answer any three questions) One question from each unit



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Sem	Course Code	Advanced Learners Course 2 - B: Middleware Technology	Total Marks: 100		Hours Per Week	Credits
			CIA: -	ESE: 100		
V	17UAMAL510				-	2

OBJECTIVE:

To enable the students to learn the overview of Client/Server concepts, various Middleware Technologies and their roles.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1 Describe the concepts of client server computing.
- CO2 Demonstrate the understanding of the Java Bean component model with EJB.
- CO3 Apply the client server applications using heterogeneous programming languages with EJB.
- CO4 Describe the object oriented middleware basics through the CORBA.
- CO5 Illustrate the development of distributed object fundamentals.

UNIT - I

Client/Server Computing: What is Client/Server? - File Servers - Database Servers - Transaction Servers - Groupware Server - Object Servers - Web Servers - Middleware - General Middleware - Service specific middleware - Client/Server Building Blocks - RPC - Messaging - Peer to Peer.

UNIT - II

EJB's Architecture: Logical Architecture - Overview of EJB's Software Architecture - A High Level View of EJB Conversation - Building and Deploying EJBs - Roles in EJB.


UNIT - III

EJB Applications: Writing EJB Session Beans - Writing EJB Entity Beans - EJB Clients - EJB Deployment.

UNIT - IV

CORBA: An Introduction to CORBA: CORBA Overview - CORBA Concepts - CORBA's Growth - CORBA Interface Definition Language - The CORBA 2 Standard.




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UNIT - V

Distributed Object Fundamentals: Selecting Data Types - Defining the Interfaces - Proxies, Stubs and Skeletons - Implementing the Servers - Implementing the Clients - Creating Objects - Invoking Object Methods - Destroying Objects.

TEXTBOOK:

1. Robert Orfali, Dan Harkey and Jeri Edwards, The Essential Client/Server Survival Guide, Second Edition, Galgotia Publications, 2002 (UNIT I).
2. Tom Valesky, Enterprise Java Beans, Second Edition, Pearson Education, 2002 (UNIT II & III).
3. Thomas J.Mowbray, Willam A.Ruth, Inside CORBA, Addison Wesley, Third Printing February, 1998 (UNIT IV).
4. Jason Pritchard, COM and CORBA Side by Side, Second Edition, Addison Wesley, 2000 (UNIT V).

BOOKS FOR REFERENCE:

1. Mowbray, Inside CORBA, First Edition, Pearson Education, 2002.
2. Judith M. Myerson, The Complete Book of Middleware, Second Edition, Auerbach Publications, 2002.
3. Arno Puder, Kay Romer, Frank Pilhofer, Distributed System Architecture - A Middleware Approach, First Edition, Elsevier, 2005.
4. G. Sudha Sadasivam, Component Based Technology, Second Edition, Wiley India, 2008.
5. Edward Yourdon, Paul Allen, Stuart Frost, Component-Based Development for Enterprise Systems, First Edition, Cambridge University Press, 1998.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
10 x 2 = 20 Marks 10 questions out of 12	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3 x 15 = 45 Marks (Answer any three questions) One question from each unit



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Sem	Course Code	Core Lab 6: Information Security Lab	Total Marks: 100		Hours Per Week	Credits
			CIA: 40	ESE: 60	5	4
VI	17UAMCP602					

OBJECTIVE:

To enable the students to implement the encryption, decryption and cryptography using various algorithms.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Develop an algorithm to encrypt data using Caesar and Vernam Cipher.

CO2 Develop an algorithm to encrypt data using code-book cipher and transposition cipher.

CO3 Implement DES and AES.

CO4 Develop an algorithm to check authentication and verify password strength.

CO5 Implement Diffie-Hellman and RSA.

1. Write a program to encrypt data using Caesar cipher method.
2. Write a program to encrypt data using Vernam cipher method.
3. Write a program to encrypt and decrypt data using code-book cipher method.
4. Write a program to encrypt data using transposition cipher method.
5. Write a program to implement DES algorithm.
6. Write a program to implement AES algorithm.
7. Write a program to secure the Database using User Authentication security.
8. Write a program to check whether a password is strong or weak.
9. Write a program to implement the Public Key Cryptography using Diffie-Hellman algorithm.
10. Write a program to implement the Public Key Cryptography using RSA algorithm.

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Sem	Course Code	Elective - II - B: Data Mining	Total Marks: 100		Hours Per Week	Credits
			CIA: 25	ESE: 75		
VI	17UAMET604				6	4

OBJECTIVE:

To enable the students to learn the techniques of mining the databases.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1 Illustrate the basic data mining concepts and their importance in business intelligent applications.
- CO2 Identify and understand the fundamental technologies used in data mining techniques.
- CO3 Demonstrate the understanding of the classification algorithms in the real world data sets.
- CO4 Demonstrate the understanding of the clustering algorithms in the real world data sets.
- CO5 Construct the association rules from the data sets.

UNIT - I

Introduction: Basic Data Mining Tasks - Data Mining Versus Knowledge Discovery in Databases - Data Mining Issues - Data Mining Metrics - Social Implications of Data Mining - Data Mining from a Database Perspective.

UNIT - II

Data Mining Techniques: Introduction - A Statistical Perspective on Data Mining - Similarity Measures - Decision Trees - Neural Networks - Genetic Algorithms.

UNIT - III

Classification: Introduction - Statistical-Based Algorithms - Distance-Based Algorithms - Decision-Tree-Based Algorithms - Neural Network-Based Algorithms - Rule-Based Algorithms - Combining Techniques.

UNIT - IV

Clustering: Introduction - Similarity and Distance Measures - Outliers - Hierarchical Algorithms - **Partitional Algorithms:** Minimum Spanning Tree - Squared Error Clustering Algorithm - K-means Clustering - Nearest Neighbor Algorithm - Clustering with Genetic Algorithm - Clustering with Neural Networks - **Clustering Large Databases:** BIRCH - DBSCAN - Clustering with Categorical Attributes.

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UNIT - V

Association Rules: Introduction - Large Itemsets - Basic Algorithms - Comparing Approaches - Advanced Association Rule Techniques - Measuring the Quality of Rules.

TEXTBOOK:

Margaret H.Dunham. Data Mining Introductory and Advanced Topics, Pearson Publications. Seventeenth Impression 2013.

BOOKS FOR REFERENCE:

1. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Second Edition, Elsevier Reprinted 2010.
2. David Hand, Heikki Mannila, Padhraic Smyth, Principles of Data Mining, PHI Learning, New Delhi, 2006.
3. S.Sumathi, S.N.Sivanandam, Introduction to Data Mining and its Applications. Springer International Edition, First Indian Reprint 2009.
4. Alex Berson, Stephen J Smith, Data Warehousing, Data Mining, & OLAP, Tata McGraw-Hill Publishing Company Limited, Eighth Reprint 2006.
5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education, Second Impression 2008.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3 x 10 = 30 Marks (Answer any three questions) One question from each unit



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Sem	Course Code	Elective - III - B : Big Data Analytics	Total Marks : 100		Hours Per Week	Credits
VI	17UAMET607			CIA : 25	ESE: 75	6

OBJECTIVE:

To enable the students to learn about the fundamental concepts of big data.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1 Define Big Data and its uses.
- CO2 Describe the Big Data technologies and Hadoop ecosystem.
- CO3 Illustrate the fundamentals of MapReduce and HBase.
- CO4 Describe the storing of data in database and Hadoop.
- CO5 Analyze the data with Pig and Hive.

UNIT - I

Overview of Big Data: What is Big Data? - History of Data Management - Evolution of Big Data - Structuring Big Data - Elements of Big Data - Big Data Analytics - Careers in Big Data - Future of Big Data - **Exploring the Use of Big Data in Business Context:** Use of Big Data in Social Networking - Use of Big Data in Preventing Fraudulent Activities - Use of Big Data in Detecting Fraudulent Activities in Insurance Sector - Use of Big Data in Retail Industry.

UNIT - II

Technologies for Handling Big Data: Distributed and Parallel Computing for Big Data - Introducing Hadoop - Cloud Computing and Big Data - In-Memory Computing Technology for Big Data - **Hadoop Ecosystem:** Hadoop Ecosystem - Hadoop Distributed File System - MapReduce - Hadoop YARN - Hbase - Hive - Pig and Pig Latin - Sqoop - ZooKeeper - Flume - Oozie.

UNIT - III

MapReduce Fundamentals and HBase: The MapReduce Framework - Techniques to Optimize MapReduce Jobs - Uses of MapReduce - Role of HBase in Big Data Processing - **Big Data Technology Foundations:** Exploring the Big Data Stack - Virtualization and Big Data - Virtualization Approaches.



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UNIT - IV

Storing Data in Databases and Data Warehouses: RDBMS and Big Data - Non-Relational Database - Polyglot Persistence - Integrating Big Data with Traditional Data Warehouses - Big Data Analysis and Data Warehouse - Changing Deployment Models in Big Data Era - **Storing Data in Hadoop:** Introducing HDFS - Introducing HBase - Combining HBase and HDFS - Selecting the Suitable Hadoop Data Organization for Applications.

UNIT - V

Exploring Hive: Introducing Hive - Getting Started with Hive - Data Types in Hive - Built-In Functions in Hive - Hive DDL - Data Manipulation in Hive - Data Retrieval Queries - Using JOINS in Hive - **Analyzing Data with Pig:** Introducing Pig - Running Pig - Pig Latin - Working with Operators in Pig - Working with Functions in Pig.

TEXTBOOK:

DT Editorial Services, Big Data Black Book, Dreamtech Press, 2015.

BOOKS FOR REFERENCE:

1. Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012.
2. David Loshin, Big Data Analytics, Morgan Kaufmann Publications, 2013.
3. Seema Acharya, Subhasini Chellappan, Big Data and Analytics, Wiley, 2015.
4. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
5. Tom White, Hadoop: The Definitive Guide, Third Edition, O'reilly Media, 2012.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3 x 10 = 30 Marks (Answer any three questions) One question from each unit



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Sem	Course Code	Elective - III - C: Internet of Things	Total Marks: 100		Hours Per Week	Credits
			CIA: 25	ESE: 75		
VI	17UAMET608				6	4

OBJECTIVE:

To enable the students to learn the building blocks of Internet of Things and understand the application area of Internet of Things.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1 Illustrate the Internet of Things enabling technologies and IOT levels.
- CO2 Demonstrate the understanding of the basic domain specific IOTs.
- CO3 Describe the various applications of IOT.
- CO4 Apply the IOT design methodology using Python.
- CO5 Illustrate the concepts of IOT Physical Devices.

UNIT - I

Introduction & Concepts: Introduction to Internet of Things - Physical Design of IOT - Logical Design of IOT - IOT Enabling Technologies - IOT Levels.

UNIT - II

Domain Specific IOTs: Home Automation - Cities - Environment - Energy - Retail - Logistics - Agriculture - Industry - Health & Life Style.

UNIT - III

M2M & System Management with NETCONF-YANG: M2M - Difference between IOT and M2M - SDN and NFV for IOT - Software defined Networking - Network Function Virtualization - Need for IOT Systems Management - Simple Network Management Protocol - Limitations of SNMP - Network Operator Requirements - NETCONF - YANG - IOT Systems management with NETCONF-YANG.

UNIT - IV

Developing Internet of Things & Logical Design using Python: Introduction - IOT Design Methodology - Installing Python - Python Data Types & Data Structures - Control Flow - Functions - Modules - Packages - File Handling - Date/Time Operations - Classes - Python - Packages.



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UNIT - V

IOT Physical Devices & Endpoints: What is an IOT Device? - Exemplary Device: Raspberry Pi - Board - Linux on Raspberry Pi - Raspberry Pi Interfaces - Programming Raspberry Pi with Python - other IoT things.

TEXTBOOK:

Arshdeep Bahga, Vijay Madiseti, Internet of Things - A hands-on approach, Universities Press, 2014.

BOOKS FOR REFERENCE:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017
2. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things - Key applications and protocols, Wiley, 2012
3. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stamatis, Karnouskos, Stefan Avesand, David Boyle, From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence, Elsevier, 2014.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), Architecting the Internet of Things, Springer, 2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
<p>10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit</p>	<p>5 x 7 = 35 Marks (Either or choice) Two questions from each unit</p>	<p>3 x 10 = 30 Marks (Answer any three questions) One question from each unit</p>




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Sem	Course Code	Skill Based Course 4 (Lab): Software Engineering and CASE Tools Lab	Total Marks: 75		Hours Per Week	Credits
VI	17UAMSP610			CIA: 30	ESE: 45	3

OBJECTIVE:

To enable the students to develop the phases of software engineering.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1 Develop the project planning phase for the software application.
- CO2 Develop the software requirement analysis document for the software application.
- CO3 Develop the design models for the software application.
- CO4 Develop the source code for the software project.
- CO5 Construct the test cases for the software project.

Perform the software engineering activity mentioned below for the Student Mark Analysis system and Payroll Processing system.

1. Problem Analysis and Project Planning:

Study the problem and prepare the project scope, objective and Gantt chart.

2. Requirement Analysis:

Identify the phases and individual modules of the project and prepare the software requirement specification.

3. Design:

i. Draw the following UML diagrams:

- Use-case diagram
- Activity diagram
- Class diagram
- Sequence diagram

ii. Draw the Data Flow Diagram (DFD)

4. Implementation:

Implement the project using VB .NET as front end and SQL Server as back end.

5. Testing:


Prepare test plan and develop test case

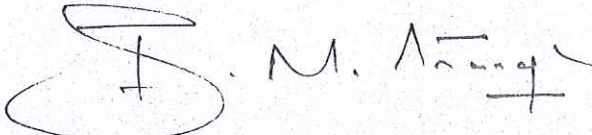


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QUESTION PAPER PATTERN	
PROGRAM 1	Program 1 should be implementation of the software engineering activity for the Student Mark Analysis System or the Payroll Processing System.
PROGRAM 2	Program 2 should be any one of the following software engineering activities for the application mentioned in the program 1 <ol style="list-style-type: none">1. Problem Analysis and Project Planning2. Requirement Analysis3. Design using UML diagrams4. Design using DFD5. Testing




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