Course Code	Title		
19U3CKC305	Core Paper VII Operating System		
Semester: IV	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

To understand the importance of Operating Systems, its functionalities to manage resources of Computer and Peripherals.

Course Outcome:

CO1	Understand the fundamentals of Operating system
CO2	Apply the scheduling mechanism for process and memory
CO3	Remember the techniques to manage the deadlock and memory
CO4	Understand the various types of operating System, Memory Allocation and IO
CO5	Apply the policies for Memory management and File systems.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Introduction: Abstract views of an OS – Goals of an OS – OS and the Computer System – Classes of Operating System: Batch Processing systems – Multiprogramming systems – Time sharing systems – Real Time Operating System – Distributed Operating System – Modern Operating systems	1	1,2
	Instructional Hours		**15**
II	Processes and Programs – Programmer View of Process – OS view of Process – Controlling Processes – Process State Transitions – Process Control Block – Process Scheduling: Scheduling Concepts and Terminology – Fundamental Techniques of scheduling – Non Preemptive scheduling policies - Preemptive scheduling policies.	1	3,4
	Instructional Hours		**15**
III	Deadlock: Definition – Deadlocks in Resource Allocation – Handling deadlocks – Deadlock Detection and Resolution - Deadlock Prevention – Deadlock Avoidance. Memory Management: Static and dynamic Memory Allocation – The Memory Allocation Model – reuse of Memory – Contiguous Memory allocation – Non Contiguous Memory Allocation.	1	11
	Instructional Hours		**15**

IV	Paging – Segmentation – Segmentation with Paging. Virtual Memory: Basics – Demand Paging – Overview of Paging – Demand Paging preliminaries – Page replacement policies – Virtual Memory using segmentation	1	5
	Instructional Hours		**15**
V	Layers of the Input Output Control System (IOCS) – Overview of I/O Organization – Disk Scheduling. File systems: File System and IOCS – Files and File Operations – Fundamental File organizations – directory Structures – Case study on LINUX OS ,UNIX OS, Android OS (Self Study)	1	7
	Instructional Hours		**15**
	Total Hours		**75**

Text Books

1. D M Dhamdhere, Operating Systems-A concept –Based Approach, 2nd Edition,2006

Reference Books

1. Stephen H. Kan, **Metrics and Models in Software Quality Engineering**, 2nd Edition,Pearson, 2003.
2. Kshirasagar Naik and Priyadarshi Tripathy (Eds), **Software Testing and Quality Assurance: Theory and Practice**, John Wiley, 2008

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	M	M	H	M	H
CO 5	M	M	M	M	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. A.Vijaya	Dr. N. Kavitha	Dean Academics	
24/1/2020	24/1/2020		24 JAN 2020

Course Code	Title		
19U3CKC306	Core Paper VIII Java Programming		
Semester: III	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:
To gain knowledge about basic Java language syntax and semantics to write java programs and understand the principles of classes, methods, inheritance, polymorphism and packages.

Course Outcomes (CO):

CO1	Remember the fundamental concepts of Object-oriented Programming
CO2	Gains the knowledge about different data types, statements, concepts and Dbase Connectivity
CO3	Able to develop programs for the different concepts
CO4	Analyze the Concepts of Exception Handling and Multithreading.
CO5	Skill to Develop application using Applet and AWT

Offered by: Information Technology

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www – Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine	1	1,2,3
	Instructional Hours		**15**
II	Constants, Variables, Data Types, Operators and Expressions, **Decision Making and Branching:** if, if...else, nested if, switch, ? : Operator, **Decision Making and Looping:** while, do, for – Jumps in Loops - Labelled Loops, Classes, Objects and Methods.	1	4,5,6,7 & 8
	Instructional Hours		**15**
III	**Interfaces: Multiple Interface**-Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. **Packages:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package.	1	10,11 & 12
	Instructional Hours		**15**
IV	**Exception Handling:** Fundamentals-Hierarchy of the Exception Classes- Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. **Multithreaded Programming:** The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation-Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads-	**2**	10 & 11

	Suspending, Resuming and Stopping Threads.		
		Instructional Hours	**15**
V	**Input/Output Classes:** Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer. **Applets:** Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. **Abstract Window Toolkit:** AWT-AWT Classes-Hierarchy of Classes in Java.awt Package-Control Fundamentals-Component Class-Basic Component Classes-Container Class.-Various Continer Class.	2	16,18& 19
		Instructional Hours	**15**
		Total Hours	**75**

Text Book(s):

1. E. Balagurusamy, **Programming with Java – A Primer**, Tata McGraw Hill Publication, 3rd Edition, 2007
2. ISRD Group, **Introduction To Object Oriented Programming Through Java**, Tata McGraw Hill Publication, Forth Reprint 2008.

Reference Book(s):

1. Patrick Naughton & Hebert Schildt, **The Complete Reference Java 2,** Tata McGraw Hill Publication**,** 3rd Edition , 2002
2. John R. Hubbard, **Programming with Java**, Tata McGraw Hill Publication, 2nd Edition, 2009

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	H	M	M	H
CO 2	H	H	M	H	H
CO 3	H	H	H	M	M
CO 4	H	H	H	H	H
CO 5	H	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. Anitha Merlin	Dr. N. Kavitha		
	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
19U3ITP303	Core Paper IX Practical in Java Programming		
Semester: III	Credits: 4	CIA : 40 Marks	ESE: 60 Marks

Course Objective:
To enable the students to develop problem solving skills and programming ability in Java Language

Course Outcomes (CO):

CO1	Develop the applications using programming concepts
CO2	Develop the applications for database connectivity
CO3	Able to debug the program
CO4	Execute and evaluate the problem given
CO5	Implement the concepts to solve the real word problems

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

S. No.	List of Practical
1	Write a Java Applications to extract a portion of a character string and print the extracted string
2	Write a Java program to insert an element (specific position) into an array.
3	Write a Java Program to implement the concept of multiple inheritance using Interfaces
4	Write a program to implement the concept of Exception Handling using predefined exception.
5	Write a Java Program to create an Exception called payout-of-bounds and throw the exception
6	Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them
7.	Write a Java Program to draw several shapes in the created windows
8	Write a Java program to import classes from user defined package and creating package.
9	Write a Java Program to create a frame with four text field's name, street, city and pin code with suitable tables. Also add a button called my details. When the button is clicked its corresponding values are to be appeared in the text fields
10.	Write a Java Program to create a frame to implement checkbox group.
11	Write a Java Program to read the data from the file using DataInputStream.
12	Write a Java Program to write the data to the existing file using BufferedOutputStream.
	Total Hours : 90

Tools for Assessment (40 Marks)

Program Creativity	Program Execution	Test I	Test II	Observation	Attendance	Total
5	5	10	10	7	3	40

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	S	H	H	M
CO 2	H	S	H	H	M
CO 3	H	S	H	H	H
CO 4	H	S	H	H	H
CO 5	H	S	H	H	H

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

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. Anitha Merlin	Dr. N. Kavitha	Dean Academics	
24/1/2020	24/1/2020		24 JAN 2020

Course Code	Title		
18U4ITZ301	Skill Based Paper I: Practical in Multimedia		
Semester: III	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective:

To enable the students to know the fundamental tool of image editing software and make them to apply in real world business.

Course Outcomes (CO):

CO1	Understand the basics of GIMP
CO2	To transform a photograph to drawing
CO3	To work with tools
CO4	To work with scripting
CO5	To work with animations

Offered by: Information Technology

Course Content **Instructional Hours / Week: 4**

S.No	List of Practical
1.	Create Sun Flower
2.	Animate Plane flying in the Clouds
3.	Create Plastic Surgery for the Nose
4.	Create See-through text.
5.	Create a Web Page
6.	Convert Black and White Photo to Colour Photo
7.	Design a visiting card containing at least one Graphic and text information.
8.	Create an animation to represent the growing Moon.
9.	Create an animation to indicate a ball Bouncing on steps
10.	Simulate movement of a cloud
11.	Display the background given (filename: Tulip.jpg) through your name
12.	Create an animation with the following features. Welcome * letters should appear one by one * the fill colour of the text should change to a different colour after. The display of the full word using flash
	Total Hours 60

Tools for Assessment (30 Marks)

Program Creativity	Program Execution	Test1	Test 2	Observation	Attendance	Total
5	5	5	5	7	3	30

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	S	H	H	M
CO 2	H	H	H	M	M
CO 3	H	S	H	H	H
CO 4	H	M	S	H	H
CO 5	H	M	H	H	S

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
19U3ITC404	Core Paper X: Software Engineering		
Semester: IV	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Transferred from V semester

Course Objective:

To gain knowledge about basic concepts of Software Engineering.

Course Outcomes (CO):

CO1	Able to understand the nature of the software and different types of process models
CO2	Gains knowledge about the requirements stage development of the software
CO3	Analyze the different types of architectural designs of the software
CO4	Evaluates different testing strategies of the software
CO5	Develops the software

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Introduction to Software Engineering:** Evolving role of software- Software- The changing nature of Software- Software Myths. A Generic view of Process- A Layered Technology	1	1
	Software Process Models: Prescriptive models- The Waterfall Model Incremental Process Models- Evolutionary Process Models.	1	3
	Instructional Hours		**18**
II	**Requirements Engineering**- Requirements Engineering Tasks- Initiating the Requirements Engineering Process- Eliciting Requirements- Building the Analysis Model.	1	7
	Building the Analysis Model- Scenario-Based Modeling- Flow Oriented Modeling.	1	6
	Instructional Hours		**18**
III	**Design Engineering:** Design Concepts -The design model.	1	9
	Creating an Architectural Design: Representing the System in Context- Defining Archetypes- Refining the Architecture into Components- Describing Instantiations of the System.	1	10
	Modeling Component-Level Design: What is a Component – Designing Class-Based Components	1	11
	User Interface Design: User Interface Analysis and Design- Interface Design steps.	1	12

	Instructional Hours		**18**
IV	**Testing Strategies:** Validation testing – System testing – **Testing Tactics:** Software testing fundamentals – White box testing – Control structure testing – Black box Testing	1	13,14
	Risk Management: Software Risks – Risk Identification – Risk Projection – Risk Refinement – Risk Mitigation, Monitoring and Management.	1	25
	Instructional Hours		**18**
V	**Reengineering:** Reengineering – Software Reengineering – Reverse Engineering- Restructuring: Code Restructuring- Data Restructuring.	1	29
	Instructional Hours		**18**
	Total Hours		**90**

Text Book(s):

1. Roger S Pressman, **Software Engineering a Practitioner's Approach**, Seventh Edition, McGraw Hill, International Edition, 2013

Reference Books(s):

1. Richard Fairley, **Software Engineering Concepts**, Tata McGraw-Hill Publishing Company Limited, 2010
2. Waman S. Jawadekar, **Software Engineering – Principles and Practice**, Tata McGraw Hill Publishing Company Limited, 2011

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	H	M	H	H
CO 2	H	M	H	H	M
CO 3	M	H	H	H	M
CO 4	H	H	M	H	H
CO 5	H	H	H	M	H

S:Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKC408	Core Paper XI Computer Networks		
Semester: IV	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective:

To inculcate knowledge on Networking concepts and technologies like wireless, Broadband and Bluetooth**.**

Course Outcomes (CO):

CO1	Understand about network hardware, software and uses of computer networks
CO2	Understand Guided Transmission Media, Wireless Transmission, and Communication Satellites
CO3	Understand error detection and correction, elementary data link protocol and Routing algorithms
CO4	Understand and Identify the applications of application layer and network security
CO5	Understand the importance of applications layer and cryptography

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Uses of computer networks**: Business Applications- Home Applications - Mobile Users - and Social Issues. **Network Hardware**: Personal Area Networks - Local Area Networks - Metropolitan Area Networks - Wide Area Networks, Internetworks. **Network software**: Protocol Hierarchies - Design Issues for the Layers - Connection-Oriented Versus Connectionless Service - Service Primitives - the Relationship of Services to Protocols - **Reference models**: The OSI Reference Model - The TCP/IP Reference Model- A Comparison of the OSI and TCP/IP Reference Models.	1	1
	Instructional Hours 18		
II	**Physical Layer - Guided Transmission Media**: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission**: Electromagnetic Spectrum –Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites**: Geostationary - Medium-Earth Orbit - Low Earth-orbit Satellites – Satellites versus Fiber.	1	2

	Instructional Hours 18		
III	**Data link Layer:** Services Provided to the Network Layer – Framing- Error Control - Flow Control. **Error detection and Correction:** Error-Correcting Codes - Error-Detecting Codes. **Elementary data link Protocols**: A Utopian Simplex Protocol- A Simplex Stop-and-Wait Protocol for an Error-Free Channel- A Simplex Stop-and-Wait Protocol for a Noisy Channel. **Sliding Window Protocols:** One-Bit sliding window protocol – A protocol using Go-Back-N – A Protocol using Selective Repeat.	1	3
	Instructional Hours 18		
IV	**Network layer: Routing algorithm**-The Optimality Principle, Shortest Path Algorithm, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Anycast Routing, Routing for Mobile Hosts, Routing in Ad Hoc Networks, **Transport layer: Elements of transport protocols**-Addressing, Connection Establishment, Connection Release, Error Control and Flow Control, Multiplexing, Crash Recovery **The Internet Transport Protocols UDP**: Introduction to UDP. TCP- Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, TCP Connection Management Modeling, TCP Sliding Window, TCP Timer Management, TCP Congestion Control.	1	5,6
	Instructional Hours 18		
V	**Application layer:** DNS—The Domain Name System, The DNS Name Space, Domain Resource Records, Name Servers, **Electronic mail**-Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery, **Network Security: Cryptography**-Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers, One-Time Pads, Two Fundamental Cryptographic Principles.	1	7,8
	Instructional Hours 18		
	Total Hours 90		

Text Book(s):

1. Andrew S. Tanenbaum; Computer Networks, 4th Edition, PHI

Reference Books:

1. Achyut Godbole,Data Communication and Networks, 2007, TMH.
2. Uyless Black, Computer Networks: Protocols, Standards, and Interfaces, 2nd ed., PHI

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	M	H	H	M	M
CO 2	H	H	M	M	M
CO 3	M	H	H	H	H
CO 4	H	M	H	H	M
CO 5	H	M	H	H	M

S:Strong ;H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. N.P. Shiju	Dr. V. Chitra		
24/1/2020	24/1/2020	24/1/20 Dean Academics	24 JAN 2020

Course Code	Title		
19U3ITP405	Core Paper XII: Practical in Software Engineering		
Semester: IV	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective:

To design and practice various Diagrams for Software Development process.

Course Outcomes (CO):

CO1	Provide a formal basis for understanding the modelling language.
CO2	Provide extensibility and specialization mechanisms to extend the core
CO3	Be independent of particular programming languages and development
CO4	Helps project teams communicate, explore potential designs, and validate the architectural
CO5	Support higher level development concepts such as collaborations, frameworks, patterns and components.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

S.No	List of Practical
1.	Write the complete problem statement for Student Result Management System
2.	Write the software requirement specification document for Library management system.
3.	Design Entity Relationship Diagram for Inventory Control System
4.	Design Data Flow Diagrams at level 0 and level 1 for Accounting system
5.	Design Use Case Diagram for Fast food billing system
6.	Design Activity Diagram of all use cases. for Bank loan system
7.	Design State Chart Diagram of all use cases for Blood bank system
8.	Design Sequence Diagram of all use cases for Railway reservation system
9.	Design Collaboration Diagram of all use cases for Automatic teller machine
10.	Design the implementation view diagram for Video library management system.

11.	Practice reverse engineering concept for Hotel management system.
12.	Practice reengineering concept for Hostel management system.
	Total Hours 90

Tools for Assessment (40 Marks)

Program Creativity	Program Execution	Test1	Test 2	Observation	Attendance	Total
5	5	10	10	7	3	40

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	M	H	H	M	M
CO 2	H	H	H	M	M
CO 3	M	H	H	M	M
CO 4	H	M	H	H	M
CO 5	M	H	H	M	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. A.Sherin	Dr. P.K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020		

24 JAN 2020

Course Code	Title		
19U3ITA404	Allied Paper IV: System Hardware and Troubleshooting		
Semester: IV	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective

To enable the students to understand the concepts of PC System, Computer Installation, and Computer Maintenance.

Course Outcomes (CO):

CO1	Understand about PC System.
CO2	Understand about On-Board Memory.
CO3	Apply the working methods of Input and Output Devices
CO4	Analyse about the different Troubleshooting techniques and Services.
CO5	Examine about diagnosing the Software.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	PC System – **Inside PC**: Motherboard – BIOS – CMOS-RAM – Motherboard Types – Processors – Chipsets – Bus Standards – SMPS.	1	1,2
	Instructional Hours		**18**
II	**On-Board Memory**: PC's Memory Organization, IO Ports – Recording and Retrieval in Magnetic Media - Hard Disk Drive and Controller.	1	3
	Instructional Hours		**18**
III	Input Devices - Monitors and Display Adapters: Display Controller – CRT Controller – Graphics Cards. **Output Devices**: Printer Controller – Laser Printer.	1	8,9,10,11
	Instructional Hours		**18**
IV	**Computer Installation**: Room Preparation – Power Supply – PC Installation. Troubleshooting and Servicing: Troubleshooting the motherboard – Trouble the Hard Disk Drivers – Troubleshooting the Printer.	1	12,13
	Instructional Hours		**18**
V	**Computer Maintenance**: Diagnostic Softwares – Data Security, Computers and Communication: Networking – Modems – Internet.	2	14,15
	Instructional Hours		**18**
	Total Hours		**90**

Text Book(s):

1. Balasubramanian. D, **Computer Installation and Servicing**, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008, 2nd Edition.

Reference Book(s):

1. Craig Zacker, John Rourke, **PC Hardware "The Complete Reference**, Tata McGraw Hill Publishing Company Limited, 2002.
2. Ron Gilster; PC Hardware, **A Beginner's Guide**, Tata McGraw Hill Publishing Company Limited, 2001.
3. 3. Stephen J Bigelow, **Troubleshooting, Maintaining and Repairing PCs**, Tata McGraw Hill Publishing Company Limited, 2008, 5th Edition.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
19U4ITZ402	Skill Based Paper II: Practical in System Hardware and Troubleshooting		
Semester: IV	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective:
To enable the students to know about PC Hardware and Troubleshooting Techniques.

Course Outcomes (CO):

CO1	Gain knowledge of Desktop Computer.
CO2	Understand the concept of Motherboard.
CO3	Develop the skill of Formatting the Disks.
CO4	Understand about Domain Name System.
CO5	Gain knowledge of Installation and Servicing.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 3**

S.No	List of Practical
1.	Study of Standard Desktop Personal Computers.
2.	Study of Motherboard and its Interfacing Components.
3.	Install and Configure Computer Drivers and System Components.
4.	Study of Disk Formatting, Partitioning and Disk Operating System Commands.
5.	Install, Upgrade and Configure Windows Operating System.
6.	Study of Remote Desktop Connections and File Sharing.
7.	Identify, Install and manage network Connections Configuring IP Address and Domain Name System.
8.	Install, Upgrade and Configure Linux Operating System.
9.	Installation Antivirus and Configuring it.
10.	Installation of Printer and Scanner Software.
11.	Disassembly and Assembly of hardware.
12.	Troubleshooting and managing the systems.
	Total Hours 45

Tools for Assessment (30 Marks)

Program Creativity	Program Execution	Test 1	Test 2	Observation	Attendance	Total
5	5	5	5	7	3	30

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	H	M
CO2	M	M	M	M	H
CO3	H	M	M	H	H
CO4	M	M	M	M	H
CO5	H	H	H	M	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKC509	Core Paper XIII: RDBMS & ORACLE		
Semester: V	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

To inculcate fundamental knowledge in RDBMS concepts and make them to create, manipulate information with the real time datasets.

Course Outcomes (CO):

CO1	Remember the Data types and fundamentals of database.
CO2	Understanding the concept of Database and Various queries in SQL , PL/SQL
CO3	Applying the concept in various tables to retrieve information.
CO4	Analysing the different types of queries in SQL.
CO5	Able to evaluate the errors in SQL & PL/SQL statements.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	**Introduction:** Database - Purpose of Database Systems - Data Models – Database Language – Transaction Management - Overall System Structure.	2	1
	A Relational approach: Relationships –Relational Database Model – Integrity Rules – Theoretical Relational Languages. **Database Design:** Data Modelling and Normalization: Data Modeling – Dependency –Normal forms – Dependency Diagrams – De –normalization.	1	1
	Instructional Hours		**15**
II	**Oracle:** Oracle an introduction – SQL –SQL *Plus Commands – Errors & Help – Alternate Text Editors. Oracle Tables.**DDL:** Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.	1	3,4
	Instructional Hours		**15**
III	**Working with Table:** Data Management and Retrieval: DML – Adding a new Row/Record – Updating and Deleting an Existing Rows/Records – Retrieving Data from Table - Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions – Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations	1	5,6
	Instructional Hours		**15**

IV	**PL/SQL:** A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. **Control Structures and Embedded SQL:** Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables.	1	10, 11
	Instructional Hours		**15**
V	**Exceptions** – Types of Exceptions. **PL/SQL Composite Data Types:** Records – Tables. Named Blocks: Procedures – Functions – Packages –Triggers –Data Dictionary Views.	1	12,13,14
	Instructional Hours		**15**
	Total Hours		**75**

Text Book(s):

1 Nilesh Shah, **Database Systems Using Oracle**, 2nd edition, PHI.

2 Abraham Silberschatz, Henry F.Korth, S. Sudarshan , **Database system Concepts**, 3rd Edition, McGraw – Hill Companies, inc.

Reference Book(s):

1. Arun Majumdar & Pritimoy Bhattacharya, **Database Management Systems**, TMH, 2007.
2. Gerald V. Post, **Database Management Systems**, 3rd Edition, TMH.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	H	M	H	H
CO 2	M	H	M	M	M
CO 3	H	H	M	H	M
CO 4	M	M	H	M	H
CO 5	H	H	H	M	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. M. Sheela Newsheeba	Dr. P. K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020		24 JAN 2020

Course Code	Title		
19U3ITC506	Core Paper XIV: Programming in VB.Net		
Semester: V	Credits: 3	CIA : 25 Marks	ESE: 75 Marks

Course Objective:

To enable the students to learn what is VB.NET fundamentals, Components & Web Forms.

Course Outcomes (CO):

CO1	To understand about .NET Framework.
CO2	To understand the concept of Windows Forms.
CO3	Able to understand about Menus, Toolbars and Controls.
CO4	Identify the Web Controls and its uses.
CO5	Able to understand the concept of ADO.Net Connections.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 5**

Unit	Description	Text Book	Chapter
I	Essential Visual Basic .NET– Upgrading from Visual Basic 6.0 - .Net Frame work and the CLR – Building VB.Net Applications- Visual Basic IDE. Visual Basic Language: Operations, Conditionals, and Loops – Visual Basic Language: Procedures, Scope and Exception Handling.	1	1,2,3
	Instructional Hours		**15**
II	Windows Forms: Adding Controls to Forms – Handling Events – Creating MDI Applications. Windows Forms: Textboxes, Rich Text Boxes, Labels and Link Labels. Windows Forms: Buttons, Check Boxes, Radio Buttons, Panels and Group Boxes. Windows Forms: List Boxes, Checked List Boxes, Combo Boxes, and Picture Boxes.	1	4,5,6,7
	Instructional Hours		**15**
III	Windows Forms: Scroll Bars, Spliters, Track Bars, Pickers, Notify Icons, Tool Tips and Timers. Windows Forms: Menus, Built-In Dialog Boxes and Printing. Windows Forms: Image List, Tree and List Views, Toolbars, Status and Progress Bars and Tab Controls.	1	8,9,10
	Instructional Hours		**15**
IV	Web Forms: Buttons, Test Boxes, Labels, Literals, Place Holders. Web Forms: Checkboxes, Radio Buttons, Tables and Panels. Images, Image Buttons, List Boxes, Drop-down Lists, Hyperlinks and Link Buttons. Validation Controls, Calendars and Ad Rotators: Validation Controls. HTML Controls.	1	16,17,18, 19,20
	Instructional Hours		**15**

V	Data Access with ADO.NET – Binding Controls to Databases – Database Access in Web Applications – Creating Window Services and Deploying Applications.	2	21,22,24, 26
		Instructional Hours	**15**
		Total Hours	**75**

Text Book(s):

1. Steven Holzner, **Visual Basic.NET**, Black Book, Dream Tech, First Edition, 2002.

Reference Book(s):

1. Jack purdum, **VB .NET Primer Plus**, Pearson Edition Publ, (2004).
2. Shapiro, Jeffrey. R, **The Complete Reference VB.NET**, TATA Mc Graw Hill Edition, (2006).
3. Hundhausen, Richard and Borg, Stevan, **Programming ADO .NET**, (2002).
4. Evangelos Petroustes, **Mastering Visual Basic.NET**, BPB Publications, First Edition, 2002.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	M	M	M	H	M
CO 2	H	H	H	H	H
CO 3	H	M	H	M	M
CO 4	H	H	H	M	H
CO 5	H	H	M	H	H

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020		24 JAN 2020

Course Code	Title		
19U3ITP507	Core Paper XV: Practical in VB.NET and Oracle Programming		
Semester: V	Credits: 4	CIA : 40 Marks	ESE: 60 Marks

Course Objective:

To learn the Basic Structures, Applications and Data Connectivity of .NET Programming Language and create, manipulate information with the real time datasets using Oracle.

Course Outcomes (CO):

CO1	Apply the concepts of Inheritance, Array of Structures and Exception Handling.
CO2	Analyse the concept of Validation Controls.
CO3	Examine the connectivity in VB.NET.
CO4	Apply DDL and DML statements
CO5	Apply about PL/SQL Statements.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

S.No	List of Practical
	VB.NET
1.	Write a program to find the Sum of Digits.
2.	Write a program to display the Calculator.
3.	Write a program to display the Payroll of an Employee using Inheritance.
4.	Write a program to display Student Marksheet using Array of Structures.
5.	Write a program to perform Arithmetic Operations on any two integer numbers.
6.	Write a program to list out the numbers divisible by 3 between the given range using Exception Handling.
7.	Write a program to validate the Given Input (Integer) by displaying the message.
8.	Write a program to maintain Student Database using ORACLE as backend.
	ORACLE
9.	a. Create a table EMPLOYEE with the appropriate attributes, apply DDL commands and manipulate with DML statements (Insert, Update and Delete). b. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY and HAVING clause.
10.	Create queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date).
11.	Write a query to retrieve name and address of all employees who work for the

	'Research' department using Join Operator
12.	Write PL/SQL code to accept the text and reverse the text and test whether the given character is Palandrome or not.
13.	Do the following Program using Cursor a. Write PL/SQL code to UPDATE values in created tables by using Implicit Cursors. b. Write PL/SQL code to display Employee details using Explicit Cursors.
14.	Write PL/SQL code for both Procedure & Function to find Factorial of a given number by using call procedure.
15.	Write pl/sql code for before insert Trigger program.
	Total Hours 90

Tools for Assessment (40 Marks)

Program Creativity	Program Execution	Test 1	Test 2	Observation	Attendance	Total
5	5	10	10	7	3	40

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	M
CO 2	M	M	M	M	H
CO 3	H	M	M	H	H
CO 4	M	M	M	M	H
CO 5	H	H	H	M	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020	24/1/20	24 JAN 2020

Course Code	Title		
18U3ITP508	Core Paper XVI: Practical in Web Technology		
Semester: V	Credits: 2	CIA : 20 Marks	ESE: 30 Marks

Course Objective:

Students will acquire the skill to choose the technology to use based on the requirements and functionality of the web site.

Course Outcomes (CO):

CO1	To develop an ability to design and implement static and dynamic
CO2	To develop HTML pages with the help of frames, scripting languages, and evolving technology like DHTML, XML.
CO3	Able to work with CSS
CO4	Analyze different types of features in XML
CO5	Able to design web site

Offered by: Information Technology

Course Content **Instructional Hours / Week: 4**

S.No	List of Practical
1	Create Web Page and apply background color, text color, horizontal rules and special characters.
2	Create Web Page and include images with different alignment and wrapped text
3	Create tables and format tables using basic table tags and different attributes.
4	Create a frameset that divides browser window into horizontal and vertical framesets.
5	Create Web Page and apply style rules using CSS.
6	Create Web Page including control structures using JavaScript.
7	Develop and demonstrate the usage of inline and external style sheet using CSS.
8	Write an HTML page including any required JavaScript that takes a number from one text field in the range of 0 to 999 and shows it in a another text field in words. If the number is out of range, it should show “out of range” and if it is not a number, it should show “not a number” message in the result box.
9	Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters, words and lines in the text entered using an alert message. Words are separated with a white space and lines are separated with new line character.
10	Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (colour, bold and font size).
11	Write a java script to validate the following fields in a registration page 1. Name (should contains alphabets and the length should not be less than 6 characters) 2. Password (should not be less than 6 characters) 3. E-mail(should not contain invalid addresses)

12	Design a web page using CSS which includes the following: 1) Use different font styles 2) Set background image for both the page and single elements on page. 3) Control the repetition of image with background-repeat property 4) Define style for links as a: link, a:active, a:hover, a:visited 5) Add customized cursors for links. 6) Work with layers.
	Total Hours: 60

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	**H**	**M**	**H**	**H**	**H**
CO 2	**H**	**M**	**H**	**H**	**M**
CO 3	**M**	**H**	**H**	**M**	**H**
CO 4	**M**	**M**	**H**	**H**	**M**
CO 5	**H**	**M**	**H**	**H**	**H**

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020	24/1/20	24 JAN 2020

Course Code	Title		
19U3ITS503	Skill Based Paper III : Artificial Intelligence		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective:

To understand how Artificial Intelligence used as a Problem Solving technique in real world.

Course Outcomes (CO):

CO1	Knowledge about overview of Artificial Intelligence
CO2	Gain Knowledge about Problem Solving methods
CO3	Apply Knowledge and reasoning to the problem
CO4	Analyze how to use reasoning methods by constructing plans
CO5	Ev methods of Knowledge Generation using Learning

Offered by: Information Technology

Course Content **Instructional Hours / Week: 4**

Unit	Description	Text Book	Chapter
I	**Introduction:** What is AI?- The foundation of AI- AI Problems. Intelligent Agent: Introduction-How Agent should act-Structure of Intelligent Agent	1 2	1,2 1
	Instructional Hours		**12**
II	**Problem Solving by searching:** Problem Solving Agents-Formulating Problems-Examples: 8 queens problem. Search Strategies- Game Playing: Minim ax-Alpha-Beta Pruning.	1	3,5
	Instructional Hours		**12**
III	**Knowledge and Reasoning:** A Knowledge based agent-Representation, Reasoning and Logic. Propositional Logic-Very simple Logic- Introduction to First Order Logic.	1	6,7
	Instructional Hours		**12**
IV	**Planning:** A simple planning agent – From Problem solving to Planning – Basic Representation of Planning – A partial Order Planning Algorithm- Example**.**	1	11
	Instructional Hours		**12**
V	**Learning:** A General model of Learning Agent – Inductive Learning – Learning from Decision Trees.	1	18
	Instructional Hours		**12**
	Total Hours		**60**

Text Book(s):

1. Stuart J.Russell, Peter Norvig, **Artificial Intelligence – A Modern Approach**, Prentice Hall Incorporation.
2. Elaine Rich, Kevin Knight, Shivasankar B.Nair, **Artificial Intellignence**, 3rd Edition, Tata-McGraw, 2009.

Reference Book(s):

1. Deepak Khemani, **A First course in Artificial Intelligence**, McGraw Hill Education Pvt Ltd, 2013.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
4	4	5	2	2	3	20

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	H	H	M	H
CO 2	H	M	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	M	H	H
CO 5	H	H	H	M	H

S:Strong, H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. L.Gnanaprasanambikai	Dr. P. K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020	24/1/20	24 JAN 2020

Course Code	Title		
18U3CKC611	Core Paper XVII Data Mining (Common to BCA & B.Sc. IT)		
Semester: VI	Credits: 4	CIA : 25 Marks	ESE: 75 Marks

Course Objective

To enable the students to the know the fundamental concept basic data mining rules and techniques to apply the real life research problems

Course Outcomes (CO):

CO1	To know basic concept of Data Mining and its Association Rules
CO2	To understand the different types of Clustering
CO3	To apply the learnt method in splitting the data and creating Decision Tree
CO4	To analyse various type of Mining like Web Mining and Text Mining
CO5	To gather knowledge of What, When and Where the data applied

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	Introduction and Association Rules : Introduction- What is Data mining – Data mining Definition – KDD Vs Data mining – DBMS Vs Data mining – Data mining Techniques – Data mining Application Areas. Association Rules- What is Association Rules - Methods to Discover Association rules – A Priori Algorithm – Partition Algorithm – Pincer Search Algorithm.	1	3, 4
	Instructional Hours 18		
II	Clustering Techniques: Introduction - Clustering Paradigms – Partitioning Paradigm – k Medoid Algorithm – CLARA – CLARANS – Hierarchical Clustering – DBSCAN – BIRCH – CURE .	1	5
	Instructional Hours 18		
III	Decision Tree – What is Decision Tree – Tree Construction Principle – Best Split – Splitting Criteria – Decision Tree Construction – CART – ID3 – CHAID – Decision Tree Construction with Presorting	1	6
	Instructional Hours 18		

IV	Web Mining – Web Content Mining – Web Structure Mining – Web Usage Mining. Text Mining – Unstructured Text - Episode Rule Discovery for Texts – Hierarchy of Categories – Text Clustering.	1	8
	Instructional Hours 18		
V	Temporal and Spatial Data Mining- What is Temporal Data Mining – Temporal Association Rule – Sequence Mining – GSP Algorithm. Spatial Mining – Spatial Mining Tasks – Spatial Clustering – Spatial Trends	1	9
	Instructional Hours 18		
	Total Hours		**90**

Text Book(s):

1. Arun K Purari ,**Data Mining Techniques**, University Press India Publications.

Reference Book(s):

1. Soman, Diwakar and Ajay, **Insight into Data Mining Theory and Practice**, Prentice Hall of India Publications.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	H	M	H	M
CO 2	H	M	M	H	H
CO 3	M	H	H	M	M
CO 4	H	H	H	H	H
CO 5	H	H	H	M	H

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

Course Designed by	Verified by HoD	Checked by	Approved by
Ms. L.Gnanaprasanambikai	Dr. P. K. Manoj Kumar	Dean Academics	
24/1/2020	24/1/2020	24/1/20	24 JAN 2020

Course Code	Title		
18U3ITZ604	Skill Based Paper IV Practical in Python Programming		
Semester: VI	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective:

- The Python course shows you how to use the free open-source to write basic programs and high level applications using concepts.
- This course will be of great interest to all learners who would like to gain a thorough knowledge and understanding of the basic components of computer programming using the Python language

Course Outcomes (CO):

CO1	To develop proficiency in creating based applications using the Python programming Language.
CO2	To be able to understand the various data structures available in Python programming language and apply them in solving problems.
CO3	To be able to do testing and debugging of code written in Python.
CO4	Analyze the different types of logics in python
CO5	Able to create a software by using python

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

S.NO	List of Practical
1.	Write python program to print Hello World
2.	Write python program to Good Morning using string variable
3.	Write python program to store data in list and then try to print them
4.	Write python program to store data in list and then try to print them.
5.	Write python program to print list of numbers using range and for loop
6.	Write python program to store strings in list and then print them.
7.	Write python program to let user enter some data in string and then verify data and print
8.	Write python program in which an function is defined and calling that function prints *Python Programming*
9.	Write python program in which a function (with single string parameter) is defined and calling that function prints the string parameters given to function.
10	Write python program in which a class is define, then create object of that class and call simple print function define in class.
	Total Hours 90

Tools for Assessment (30 Marks)

Program Creativity	Program Execution	Test1	Test 2	Observation	Attendance	Total
5	5	5	5	7	3	30

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	H	H	H	M
CO 2	H	H	H	H	M
CO 3	H	H	M	H	H
CO 4	H	M	H	H	M
CO 5	H	H	M	H	H

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKE501	Discipline Specific Elective Paper I: E-Commerce (Common to CS/CA/IT/CT)		
Semester: V	Credit: 4	CIA : 25 Marks	ESE : 75 Marks

Course Objective:
On Successful Completion of this subject the students should have knowledge in E-Commerce, E-Market, EDI, Business Strategies etc.,

Course Outcomes (CO):

CO1	Understand the concepts of E-Commerce
CO2	Explain to students why information systems are so important today for business and management
CO3	Evaluate the role of the major types of information systems in a business environment and their relationship to each other
CO4	Identify the major management challenges to building and using the Internet
CO5	Applications of e-Commerce

Offered by: Computer Science

Course Content **Instructional Hours/Week: 6**

Unit	Description	Text Book	Chapter
I	**Introduction to E-Commerce:** The Scope of E-Commerce – Definition-E-Commerce & the Trade Cycle – Electronic Market – Electronic Data Interchange – The Internet Commerce – The E-Commerce in Perspective. Business Strategy: The Value Chain – Supply Chains – Porter's Value Chain Model – The Inter Organizational Value Chain.	1	1&2
	Instructional Hours		**18**
II	**The Introduction to Business Strategy** – Strategic Implications of IT – Technology – Business Environment – Business Capability – Existing Business Strategy – Strategy Formulation & Implementation Planning – e-Commerce Implementation - Commerce Evaluation. The Inter Organizational Transactions – The Credit Transaction Trade Cycle. A Variety of Transactions – Pens & Things.	1	4&6
	Instructional Hours		**18**
III	**E-Markets:** Markets – E-Markets-Usage of E-Markets-Advantages & Disadvantages of E-Markets. EDI: Introduction – Definition - Benefits of EDI – EDI Standards – EDI Communication EDI Implementation – EDI Agreement – EDI Security.	1	7,8&9
	Instructional Hours		**18**

IV	**The Internet :** The Internet – The Development of the Internet – TCP/IP – Internet Components – Uses of the Internet – A Page on the Web : HTML Basics – Introduction to HTML – Further HTML – Client Side Scripting – Server Side Scripting – HTML Editors & Editing – The Elements of E-Commerce : Elements – e-Visibility – The e-Shop – On line Payments - Delivering the Goods – Internet e-Commerce Security.	1	13,14 & 15
	Instructional Hours		**18**
V	**E-Business:** Introduction - The Internet Bookshops – Grocery Supplies - Software Supplies and Support – Electronic Newspapers – The Internet Banking - The Virtual Auctions – Online Share Dealing – Gambling on the Net – e-Diversity.	1	16
	Instructional Hours		**18**
	Total Hours		**90**

Text Book:

1. David Whiteley, **E-Commerce – Strategy, Technology & Applications**, Tata Mc Graw-Hill.

Reference Book:

2. Jeffrey F.Rayport, Bernard J.Jaworski, **Introduction to E-Commerce**, 2nd Edition TMH.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKE502	Discipline Specific Elective Paper I: Compiler Design (Common to CS/CA/IT/CT)		
Semester: V	Credit: 4	CIA : 25 Marks	ESE : 75 Marks

Course Objective:
On Successful Completion of this subject the students can understand the major concept areas of language translation and compiler design and enrich the knowledge of modern compiler & its features.

Course Outcome:

CO1	Apply the knowledge of Lex tool & Yacc tool to develop a scanner & parser.
CO2	Design & conduct experiments for Intermediate Code Generation in compiler.
CO3	Knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.
CO4	Knowledge in various phases of compiler ant its use, code optimization techniques, machine code generation, and use of symbol table.
CO5	Knowledge in code generation

Offered by: Computer Applications

Course Content **Instructional Hours/Week: 6**

Unit	Description	Text Book	Chapter
I	**Introduction:** Language Processor – Structure of a Compiler – Evolution of programming Language – Application of Compiler Technology – Programming Language basics	1	1
	Instructional Hours		**18**
II	**A Simple Syntax – Directed Translator:** Introduction – Syntax definition – Syntax directed Translation – Parsing – Lexical Analysis - Symbol Table.	1	2
	Instructional Hours		**18**
III	**Lexical Analysis:** The role of lexical analyzer- Input Buffering – Specification of tokens – Recognition of token – the lexical analyzer generator Lex – Finite Automata – From Regular Expression to Automata	1	3
	Instructional Hours		**18**
IV	**Syntax Analysis:** Introduction – Context free Grammer – top down parsing – bottom up parsing – Introduction to LR Parsing – Simple LR **Intermediate Code Generation:** Variant of syntax trees – Three address code – type Checking – Control flow – intermediate code for procedure	1	4,6

		Instructional Hours	**18**
V	**Code Generation**: Issues in the Design of a code generator – Target Language – Addresses in the Target Code – Basic block and flow graph – optimization of basic block – A simple code generator	1	8
		Instructional Hours	**18**
		Total Hours	**90**

Text Book :

1. Alfred V.Aho, Monica S Lam, **Compilers: Principles, Techniques, & Tools**, 2nd Edition, Pearson Education, 2009.

Reference Books:

1 A.Puntambekar, **Compiler Design**, 1st Edition, Technical Publication, Pune, 2009.
2 V. Raghavan, **Principles Of Compiler Design**, Tata McGraw-Hill Education, 2010

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKE503	Discipline Specific Elective Paper I: Internet of Things (Common to CS/CA/IT/CT)		
Semester: V	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

To understand the Data and Knowledge Management and use of Devices in IoT Technology, Understand State of the Art – IoT Architecture and Real World IoT Design.

Course Outcome:

CO1	Understand the vision of IoT from a global context.
CO2	Determine the Market perspective of IoT.
CO3	Use of Devices, Gateways and Data Management in IoT.
CO4	Building state of the art architecture in IoT.
CO5	Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**M2M to IoT**-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.	1	2
	Instructional Hours		**18**
II	**M2M to IoT – A Market Perspective**– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. **M2M to IoT-An Architectural Overview**– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.	1	3, 4
	Instructional Hours		**18**
III	**M2M and IoT Technology Fundamentals-** Devices and gateways, Local and wide area networking, Data management.	1	5
	Instructional Hours		**18**
IV	Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management	1	5
	Instructional Hours		**18**
V	**IoT Architecture-State of the Art –** Introduction, State of the art. **Architecture Reference Model-** Introduction, Reference Model and architecture, IoT reference Model	1	6,7
	Instructional Hours		**18**
	Total Hours		**90**

Text Book:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, **From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence**, Academic Press, 2014.

2. https://www.tutorialspoint.com/internet_of_things/index.htm

Reference Books:

1. Vijay Madisetti and Arshdeep Bahga, **Internet of Things (A Hands-on-Approach)**, VPT, 2014.

2. Francis daCosta, **Rethinking the Internet of Things: A Scalable Approach to Connecting Everything**, Apress Publications, 2013

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
19U3CKE504	Discipline Specific Elective Paper I: Big Data Analytics (Common to CS/CA/IT/CT)		
Semester: V	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

To provide an overview of an exciting growing field of big data analytics, analyse big data like Hadoop, NoSql Map-Reduce and learn fundamental techniques and principles in achieving big data analytics

Course Outcome:

CO1	Know about the big data analytics
CO2	Tools in big data analytics using Hadoop
CO3	Data model in big data analytics using NoSql
CO4	Understanding and Know about Map Reduce Programming
CO5	Gain more knowledge about Hadoop streaming with R

Offered by: Computer Technology

Course Content **Instructional Hours/Week: 6**

Unit	Description	Text Book	Chapter
I	**INTRODUCTION TO BIG**: Introduction to Big Data, Big Data characteristics, types of Big Data, Traditional vs. Big Data business approach, Bigdata Challenges, Case Study of Big Data Solutions.	1	1
	Instructional Hours		**18**
II	**HADOOP:** Introducing Hadoop – Why Hadoop – Why not RDBMS – RDBMS versus Hadoop – History of Hadoop – Hadoop Overview – Hadoop Distributed File System (HDFS) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem	2	2
	Instructional Hours		**18**
III	**NoSQL DATA MODEL:** Introduction to NoSQL – NoSQL Business Drivers – NoSQL Data Architectural Patterns – Variations of NoSQL Architectural Patterns – Using NoSQL to Manage Big data – Case study of NoSQL	1	3
	Instructional Hours		**18**
IV	**MAP REDUCE Programming:** Introduction to MapReduce – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression.	2	4

	Instructional Hours		**18**
V	**Hadoop streaming with R:** Understanding the basics of Hadoop streaming – How to run Hadoop streaming with R – Understanding a MapReduce application – Understanding how to code and run a Map-Reduce application – how to explore the output of Map Reduce application.	3	4
	Instructional Hours		**18**
		Total Hours	**90**

Text Books:

1. Radha Shankarmani, M Vijayalakshmi, **Big Data Analytics**, Wiley Publications,first Edition 2016.
2. Seema Acharya, Subhashini Chellappan, **Big Data and Analytics**, Wiley Publication, first edition. Reprint in 2016.
3. Vignesh Prajapati, **Data analytics with R and Hadoop**, Copyright © 2013, Packt Publishing.

Reference Books:

1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, **Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses**, Wiley, 2013
2. Bill Franks, Taming**,The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics**, Wiley

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	S	H
CO 3	H	H	M	H	H
CO 4	H	S	H	M	H
CO 5	S	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
19U3CKE605	Discipline Specific Elective Paper II - Software Quality Assurance (Common to CS/CA/IT/CT)		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

To describe Quality Assurance, understand quality components and apply the quality models.

Course Outcome:

CO1	Knowledge about the concept, factors, of Quality Assurance
CO2	Understand various components of Quality Assurance
CO3	Analyze Testing process in Quality Assurance
CO4	Analyze various Software Quality metrics
CO5	Interpret the various on Standards for Software Quality.

Offered by: Computer Science

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**What is Software Quality?:** What is software?-Software error, faults and failures-Classification of the causes of software errors-Software Quality Definition and objectives – software quality assurance and software engineering. **Software Quality factors:** Need for comprehensive software quality requirements – classification of software requirements into software quality factors – product operation software quality factors- product revision software quality factors – product transition software quality factors.	1	2,3
	Instructional Hours		**18**
II	**Components of SQA system :** SQA system and architecture – Pre-project components – software project life cycle components – Infrastructure components for error prevention and improvement – Management SQA components – SQA standards, system certification and assessment components – Organizing for SQA – the human components.	1	4
	Instructional Hours		**18**
III	**Software testing – strategies:** Definition and objectives-software testing strategies – software test classifications – White box testing – Black box testing. **Software testing – implementation:** Testing process – Test-case Design – Automated testing – Alpha – beta site testing programs.	1	9,10
	Instructional Hours		**18**

IV	**Software Quality metrics:** Objectives of quality measurement – Classification of software quality metrics – Process metrics- Product metrics- Implementation of Software Quality metrics – Cost of Software Quality metrics-Classical model of Software Quality.	1	21,22
		Instructional Hours	**18**
V	**Quality management standards:** scope –Main standards of software quality management - ISO 9000-3 – certification according to ISO 9000-3 standard – Capability Maturity model principles, structure and processes area – Bootsrap methodology.	1 2	23 4
		Instructional Hours	**18**
		Total Hours	**90**

Text Books

1. Daniel Galin, **Software Quality Assurance From Theory to Implementation**, Pearson education Ltd.,2004.
2. Claude Y. Laporte and Alain April, **Software Quality Assurance**, IEEE Press wiley, 2018.

Reference Books

1. Stephen H. Kan, **Metrics and Models in Software Quality Engineering**, 2nd Edition,Pearson, 2003.
2. Kshirasagar Naik and Priyadarshi Tripathy (Eds), **Software Testing and Quality Assurance: Theory and Practice**, John Wiley, 2008

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	M	M	H	M	H
CO 5	M	M	M	M	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKE606	Discipline Specific Elective Paper II: Information Security (Common to CS/CA/IT/CT)		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

Enable the students to understand basic concepts of different Information Security concepts

Course Outcomes:

CO1	Remember the basic terms in Information Security.
CO2	Understand the basics of information security.
CO3	To gain knowledge about Physical Operations, network and software development security.
CO4	Analyze different laws and Ethics.
CO5	Evaluate the principles of security.

Offered by: Computer Applications

Course Content **Instructional Hours/Week: 6**

Unit	Description	Text Book	Chapter
I	Why Study Information Security? Information Security Principles of Success	1	1,2
	Instructional Hours		**18**
II	Certification Programs and the Common Body of Knowledge Governance and Risk Management	1	3,4
	Instructional Hours		**18**
III	Security Architecture and Design Business Continuity Planning and Disaster Recovery Planning	1	5,6
	Instructional Hours		**18**
IV	Law, Investigations, and Ethics - Physical Security Control - Operations Security -Access Control Systems and Methodology	1	7,8,9,10
	Instructional Hours		**18**
V	Cryptography - Telecommunications, Network, and Internet Security - Software Development Security - Securing the Future	1	11,12,1314
	Instructional Hours		**18**
	Total Hours		**90**

Text Book(s):

1. Mark Merkow (2006), **Information Security, 1/e: Principles and Practices** Pearson Education.

Reference Book(s):

1. Nina Godbole (2009), **Information Systems Security**, Wiley Publications.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar	Dean Academics	24 JAN 2020
24/1/2020	24/1/2020		

Course Code	Title		
18U3CKE607	Discipline Specific Elective Paper II: Cloud Computing (Common to CS/CA/IT/CT)		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:
Provide the students with the fundamental knowledge, understanding, and skills required for designing and building applications to exploit cloud computing paradigm.

Course Outcome:

CO1	Remember the key dimensions of the challenge of Cloud Computing
CO2	Understand the Develop and deploy cloud application using popular cloud platforms.
CO3	Design and develop highly scalable cloud-based applications by creating and configuring virtual machines on the cloud and building private
CO4	Analyze different types of services in cloud computing
CO5	Make recommendations on cloud computing solutions for an enterprise.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Introduction** Defining cloud computing –Cloud types –Characteristic of computing– Open standards. Exploring the cloud computing Stack-Connecting to the cloud – Understanding services and applications by type.	1	1, 3, 4
	Instructional Hours		18
II	**Understanding Abstraction and Virtualization** Using virtualization technique – Load balancing- Understanding hypervisors –Machine imaging- Porting applications. Capacity planning – Baseline and metrics – Network capacity – Scaling. Exploring platform as service.(7)	1	5, 6, 7
	Instructional Hours		18
III	**Cloud Computing Web Services** Google Web service – Surveying the Google application portfolio – Google toolkit. Amazon web services– Components and services– EC2- Storage systems– Database services. Microsoft cloud services – Windows azure platform – Windows live.	1,2	8, 9, 10
	Instructional Hours		18
IV	**Cloud Infrastructure** Managing the cloud – Administrating the cloud– Management products. Communicating with the cloud – Instant messaging – Collaboration technologies–Social networks. Media and streaming.	1	11, 18, 19

	Instructional Hours		**18**
V	**Cloud Applications and Mobile Cloud** Working with mobile devices – Smartphone with the cloud. Mobile web services-Scientific applications – Business and consumer applications.	**1, 2**	**20, 10**
	Instructional Hours		**18**
	Total Hours		**90**

Text Books:

1. Barrie Sosinsky, **Cloud Computing Bible**, Wiley Publishing, Inc,.2011
2. Rajkumar Buyya, Christian Vecchiola and ThamariSelvi. S, **Mastering in Cloud Computing**, McGraw Hill Education (India) Private Limited, 2013

Reference Books:

1. Michael Miller,**Cloud Computing**, Pearson Education, New Delhi, 2012
2. Anthony T Velte, **Cloud Computing: A practical Approach**, Tata McGraw Hill, 2010
3. Fern Halper, Marcia Kaufman, Bloor Robin and Judith Hurwit, **Cloud Computing for Dummies**, Wiley, India, 2009.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

S:Strong; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3CKE608	Discipline Specific Elective Paper II: Cyber Security (Common to CS/CA/IT/CT)		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

On successful completion of the course the students should have: Understood the Information security concepts.

Course Outcome:

CO1	Remember the hardware, software, components of a network and the interrelations.
CO2	Understand the concept of multiple operating systems, systems software, network services and security. Evaluate and compare systems software and
CO3	Explain networking protocols and their hierarchical relationship hardware and software. Compare protocol models and select appropriate protocols
CO4	Develop solutions for networking and security problems, balancing business concerns, technical issues and security.
CO5	Able to product system against threat.

Offered by: Computer Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	Information and its Representation - What is information – Quality of Information – Value of Information – Information Processing – Information Processing cycle in computers – information Representation and codes – Number Representation – Binary Representation of positive Integers– signed Binary Integers – Positive Binary Fractions – signed Binary Fractions – Representing Fractions in Binary – Representation of Alphanumeric Data – Current Trends in Information Technology – semiconductor Technology – Information storage – Networking – Applications of IT – IT Applications in Business – Modeling and simulation.	1	1
	Instructional Hours		**18**

II	Computer Networks and Internet – An overview - What is computer Network – Basic networking components – what is Internet – Internet Protocols – Internet protocol types – OSI Reference versus TCP/IP Model – OSI model layers – TCP/IP Model layers-TCP/IP Layers –The TCP/IP Model – Internet Protocol (IP) – Internet Protocol version 4 (IPV4) – Internet Protocol version 6 (IPV6).	1	2
	Instructional Hours		**18**
III	Information storage and communication - Information storage – purpose of storage - Types of storage Devices – File organization – Internal file structure – External file structure and file extension – Data communication – an overview –what is data communication – signals – Basic Data communication Model – Modulation Techniques.	1	3
	Instructional Hours		**18**
IV	Information security Framework –Information security and privacy – security Framework –Information systems security Framework – Framework for Network security .Access control Techniques –Computer Security and Access control – Access control Techniques – Biometric Authentication – Authentication Token – Token types and usage – Digital signature – Embodiments and vendors – Related Authentication Technologies.	1	8
	Instructional Hours		**18**
V	Cyber Law and Ethics – Introduction to cybercrime – Prevention – preventive steps for Individuals – preventive steps for organizations and government – How to protect the computer against threats.	1	6
	Instructional Hours		**18**
	Total Hours		**90**

Text Book(s):

1. PankajAgarwal, **Information Security & Cyber Laws**, Acme Learning Private Limited, First Edition, 2010

Reference Book(s):

1. Amy Rose, Deborah Arrand, Kristin E.Ohlim, Malloy, Michael G.Solomon, Mike Chapple, “Information Security Illuminated”, Jones &Barlett Publishers, 2005.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	H	H
CO 3	H	H	M	H	H
CO 4	H	H	H	M	H
CO 5	H	H	H	H	M

S-Stromg; H-High; M-Medium; L-Low.

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3ITE609	Elective Paper III - Digital Marketing		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

- To identify core concepts of marketing and the role of marketing in business and society.
- To acquire Knowledge of social, legal, ethical and technological forces on marketing decision-making.
- Appreciation for the global nature of marketing and appropriate measures to operate effectively in international settings.

Course Outcome:

CO1	Ability to develop marketing strategies based on product, price, place and promotion objectives.
CO2	Ability to create an integrated marketing communications plan which includes promotional strategies and measures of effectiveness.
CO3	Ability to communicate the unique marketing mixes and selling propositions for specific product offerings.
CO4	Ability to construct written sales plans and a professional interactive oral sales presentation.
CO5	Ability to formulate marketing strategies that incorporate psychological and sociological factors which influence consumers.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	Introduction to think – Digital Marketing Strategy – Introduction – Key terms and Concepts – What is Marketing – What is Digital Marketing - Understanding Marketing Strategy – The Building Blocks of Marketing Strategy – Crafting a Digital Marketing Strategy – Case Study	1	2
	Instructional Hours		**18**
II	Market Research – Introduction – Key terms and Concepts – the Importance of Market Research – Key Concepts in Market Research – Online Research Methodologies – Justifying the Cost of Research – tools for the trade – Advantages and Challenges	1	3
	Instructional Hours		**18**
III	Content Marketing Strategy – Introduction – Key Terms and Concepts – Defining Content Marketing – Strategic Building Blocks – Content Creation – Content Channel Distribution – Tools for the Trade – Advantages and Challenges	1	
	Instructional Hours		**18**

IV	User Experience Design – Introduction – Key Terms and Concepts – Understanding UX design – Core principles of UX design – Mobile UX – Step –by-step guide to UX design – Tools of the trade – Case Study	1	
		Instructional Hours	**18**
V	Web development and Design – Introduction – Key terms and concepts – Web design – Web Development – Mobile Development – Step-by-step guide to building a website – Case study	1	
		Instructional Hours	**18**
		Total Hours	**90**

Text Book(s):

1. Rob Stokes, **E- Marketing the Essential guide to marketing in a digital world**, 5th Edition, 2017.

Reference Book(s):

Online Reference Book:

2. https://ondigitalmarketing.com/learn/odm/

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	S	H
CO 3	H	H	M	H	H
CO 4	H	S	H	M	H
CO 5	S	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3ITE610	Elective Paper III - Applied Cryptography		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

To learn the objectives, need and mechanisms for providing security to information in storage and in transmission.

Course Outcome:

CO1	Understands Cryptography importance in information security
CO2	Classify the Symmetric and Asymmetric Cryptographic Algorithms
CO3	Learn the mechanism of Key Distribution
CO4	Know the Hash function usage in Message Authentication and Digital Signature in User Authentication
CO5	Able to apply Cryptographic concept and techniques in various fields.

Offered by: Information Technology

Course Content **Instructional Hours/Week: 6**

Unit	Description	Text Book	Chapter
I	**WHAT IS SECURITY:** Key information security concepts, Critical Characteristics of Information, CNSS Security Model, Components of Information Systems, Balancing information security and access, Approaches to information security implementation, Security system Development life cycle, Security Professionals and the organization	1	1
	Need for security, Introduction, Business need first, Threats, Attacks, Secure Software Development.	1	2
	Instructional Hours		**18**
II	**CRYPTOGRAPHIC CONCEPTS AND TECHNIQUES:** Symmetric Cipher Model- Substitution Techniques- Transposition Techniques- Rotor Machines- Stegnography.	2	2
	Instructional Hours		**18**
III	**SYMMETRIC KEY ALGORITHM:** Stream Cipher-RC4	2	7
	Block Cipher-Block Cipher Principles **DES**: Strength of DES- Differential and Linear Cryptanalysis- Block Cipher Design Principles	2	3
	AES: structure, Transformation functions, Key expansion	2	5
	Instructional Hours		**18**
IV	**ASYMETRIC KEY ALGORITHM:** Public key Cryptography –RSA. Other Public key Cryptosystems- Diffie-Hellman Key exchange - ElGamal Cryptographic System- Elliptic Curve Cryptography.	2	9,10
	Instructional Hours		**18**
V	**CRYPTOGRAPHIC HASH FUNCTIONS**-Applications of	2	11 – 14

	hash functions, Two simple hash functions, SHA,SHA-3 MAC-Requirement and functions. Digital Signature- Properties, Digital Signature Standard Key Management and Distribution- Symmetric key Distribution using symmetric encryption- Symmetric key Distribution using asymmetric encryption-Distribution of Public keys User authentication- Kerberos.	
Instructional Hours		**18**
	Total Hours	**90**

Text Books:

1. Michael E Whitman and Herbert J Mattord, **Principles of Information Security**, Course Technology, Cengage Learning, 2012, 4th Edition.
2. William Stallings, **Cryptography and Network Security**, Pearson Education, 4th edition, 2015.

Reference Books:

1. Atul Kahate, **Cryptography and Network Security**,Tata McGraw Hill, 2013.
2. Mark Stamp, **Information Security, Principles and Practice**, Wiley India, 2015.
3. M.Arthur Conklin, Greg White, **Principles of Information Security**, TMH, 2012.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	S	H
CO 3	H	H	M	H	H
CO 4	H	S	H	M	H
CO 5	S	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3ITE611	Elective Paper III - Bio Informatics		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

- Understanding fundamentals of Bioinformatics
- Understanding concepts of Biological Sequences and Usage of Databases on Bioinformatics
- Applying Technologies to analyse molecular modelling and viewing.

Course Outcome:

CO1	Able to understand concepts and principles of bioinformatics systems
CO2	Able to apply software tools to analyse, model molecular structures and sequences for bioinformatics.
CO3	Understand the concept of Perl, CORBA
CO4	Analyze different types of syntax and semantic errors
CO5	Able to create application using concept of Perl.

Department Offered: Information Technology

Course Content **Instructional Hours/Week: 6**

Unit	Description	Text Book	Chapter
I	**Introduction** – Objectives of Bioinformatics – Kind of data – Multiplicity of data and data mining – Major Bioinformatics databases – Data Integration – Data Analysis – Careers in Bioinformatics – Databases and Tools.	1	1
	Instructional Hours		**18**
II	**Information Molecules and Information Flow –** Introduction – Basic Components – Structure of DNA – Structure of RNA – Genes – analyzing DNA. **Using Linux –** Introduction to Linux – Basics of Linux System – Using Linux file system and Directories – Text processing – writing Shell programs.	1	3,5
	Instructional Hours		**18**
III	**Programming with Perl –** Introduction to Perl – programming in Perl – Arrays – File Input and Output – Perl applications for bioinformatics. **Relational and Object oriented Databases –** Introduction – Types of Databases – Object oriented Databases – CORBA – Managing Biological Databases – Tools for Sequence alignment.	1	6,7,8,11
	Instructional Hours		**18**
IV	**Gene Prediction methods**-Introduction – using patterns to Predict genes – methods of Gene prediction – Gene prediction	1	14,18

	tools – Understanding and using Biological databases. **Proteomics –** Introduction – Proteome analysis – tools for proteome analysis – metabolic pathways – genetic networks		
	Instructional Hours		**18**
V	**Methods of statistical Analysis –** Introduction – Fundamentals of Probability and statistics –application of statistical tools. **Problem solving in Bioinformatics –** Introduction – Genomic analysis – strategies and Options for similarity search – Practical considerations – Flowchart for protein structure prediction	1	20,21
	Instructional Hours		**18**
	Total Hours		**90**

Text Book

1. S. C.Rastogi, Namita Mendiratta & Parag Rastogi, Bioinformatics Concepts, Skills & Applications , CBS Publications, New Delhi, 2003.

Reference Books:

1. Des Higgins & Willie Taylor I, **Bioinformatics sequence Structures and Databases**, Oxford University Press, 2000.
2. Teresa K. Attwood and David J.Parry Smith, **Introduction to Bioinformatics**, Pearson Education, Singapore, 2005
3. David. W. Mount. **Bioinformatics: sequence & Genome Analysis**, CBS Publications and Distributors, New Delhi, 2005

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	S	H
CO 3	H	H	M	H	H
CO 4	H	S	H	M	H
CO 5	S	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020

Course Code	Title		
18U3ITE612	Elective Paper III - Open Source Software		
Semester: VI	Credits: 4	CIA:25 Marks	ESE: 75 Marks

Course Objective:

To understand the fundamental knowledge in Open source software and PHP programming

Course Outcome:

CO1	Fundamental Knowledge in Open source software
CO2	Describe and use the features and syntax of programming language PHP
CO3	To develop applications in PHP using various concepts like arrays, Functions, etc
CO4	To be able to retrieve and display data from mySQL database tables using PHP
CO5	To be able to use PHP to connect to mySQL databases and perform basic database operations.

Offered by: Information Technology

Course Content **Instructional Hours / Week: 6**

Unit	Description	Text Book	Chapter
I	**Open source software & Introduction to PHP :** Introduction What Is Free Software and How Does It Relate to Open Source?, What Is Open Source Software? -The Open Source Definition; Introduction to PHP: History, PHP Basics: Data types- Identifiers – Variables – Constants – Expressions - String Interpolation - Control Structure.	1,2	1,3
	Instructional Hours		**18**
II	**Functions & Arrays:** Invoking a Function-creating a Function – Function Libraries. Arrays : what is an Array - creating an array - Adding element – Traversing Elements – locating Array elements – sorting array – merging, slicking, splitting & Dissecting Arrays – other useful Array Functions.	2	4,5
	Instructional Hours		**18**
III	**Object-oriented PHP & Advanced OOPS Features:** Benefits & OOPS – Key OOP concepts – Constructor & Destructors – static class Members - The instance of keyword – Helper function- Advanced OOPs Features: Advanced OOPs Features Not supported by PHP – object cloning- Inheritance – Interfaces-Abstract classes.	2	6,7
	Instructional Hours		**18**
IV	**Error & Exception Handling:** Exception Handling – Error logging – Strings & Regular Expressions: Regular Expressions – other string – specific functions –working with the File & Operating systems: working	2	8

	with files – Executing shell commands.		
	Instructional Hours		**18**
V	**Web Services & Database Connectivity:** Web services: Why web services?-Simple XML – SOAP, Using PHP with MySQL.	2	20
	Instructional Hours		**18**
	Total Hours		**90**

Text Books:

1. Open Sources: **Voices from the Open Source Revolution**
2. W. Jason Gilmoree, **Beginning PHP and MySQL From Novice to Professional**, 3rd Edition, A press

Reference Books:

1. **PHP5 and MYSQL Bible**, Wiley India Pvt. Ltd, original Language English Edition 2008
2. Steven Holzner, **The Complete Reference PHP**, TATA McGraw –Hill Edition.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Attendance	Total
5	5	6	3	3	3	25

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	H	M	H	H	H
CO 2	M	H	H	S	H
CO 3	H	H	M	H	H
CO 4	H	S	H	M	H
CO 5	S	H	H	H	M

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

Course Designed by	Verified by HoD	Checked by	Approved by
Dr. P.K. Manoj Kumar	Dr. P.K. Manoj Kumar		
24/1/2020	24/1/2020	Dean Academics	24 JAN 2020