ANNEXURE - 14

INFORMATION TECHNOLOGY

VISION:

➢ *To participate in the establishment of a vibrant and modern India where the young will be free from illiteracy and unemployment and be competitive enough to fit into the knowledge based society with self discipline national outlook and religious tolerance.*

MISSION:

➢ *To provide computer based job oriented education and prepare the younger generation for the better future for improving their capabilities to face the competition.*

Programme Educational Objectives (PEO)

PEO1	Natural navigators and nimble witted in diagnosing problems, in enlisting steps to rectify them and in providing the most effective solutions in the best possible way
PEO2	Moralistic while demonstrating their academic caliber, in recognizing and acknowledging value systems, in making decisions, accepting responsibilities and while concerned about society and public issues and needs
PEO3	Self-reliant in learning and in real life job situations through which they support their peers and become stable and reliable students, workers and citizens
PEO4	Steadfast in shielding and nurturing environment and stimulate its sustainable growth for a bright future
PEO5	Versatile and vibrant communicators in person and through other media. Vigilant/vital in prolonging the long winding richness and tradition of their mother tongue
PEO6	Neoteric global citizens of our nation, who would take the nation's pride around the world by adapting and adopting the scientific and technological developments
PEO7	Civilized and confident graduates, who believe in lifelong learning with the socio-cultural changes in the generations to come

Programme Objectives (PO)

PO1	Able to diagnose the problems and to find the most effective solutions in ethical manner, processes to meet the specifications with consideration for the public safety and environmental development.
PO2	Demonstrate the academic knowledge and need for sustainable development in multidisciplinary fields. Able to tackle technical challenges and Public issues and needs.
PO3	Can apply ethical learning principles and commit to professional practice in IT profession. Function effectively as an individual, and as a member in a group to support peers or leader in teams, and in multidisciplinary settings.
PO4	Ability to engage and nurish themselves and the environment for sustainable growth and bright future. Exhibit analytical decision making and problem solving skills for handling dynamic real time challenges
PO5	Communicate effectively in oral, written and graphical form to extend ethical attitude and leadership skills. Manage effectively with the large society of IT professionals

PROGRAM SPECIFIC OUTCOME (PSO)

PSO1	Apply and use current technical concepts and practices in the core information technology concepts like Information Management, Programming, and Networking.
PSO2	Analyze and recommend the appropriate IT Infrastructure required for the implementation of the project
PSO3	An ability to analyze problem, design algorithm appropriate for the required solutions and able to integrate IT-based solutions into user Environment
PSO4	Design and develop software system for worldwide networks of computers to provide solutions to real-world problems
PSO5	Evolves as competent IT professional possessing leadership skills and domain knowledge for developing solutions for multidisciplinary domain.

PEO - PO MAPPING

	PO1	PO2	PO3	PO4	PO5
PEO1	3	3	3	2	2
PEO2	3	3	3	3	2
PEO3	3	3	3	2	2
PEO4	3	3	2	3	2
PEO5	3	3	3	2	3
PEO6	1	1	1	3	3
PEO7	1	1	1	3	3

3- Strong   2- Medium   1- Low

B.Sc INFORMATION TECHNOLOGY

SEM	Part – I	Part – II	Part – III					Part – IV			Part – V (6th Hr)	ACC (6th Hr)			SLC
I Sem.	I Lang (6)	II Lang (6)	Core (6)	Core Lab (6)	Allied IT (4)	-	-	SBE (2)	–	Total (30)	NCC/NSS/PED R.R/ Li.Sc. (3)	Com.Eng (2)	Comp.Lit (1)	–	–
II Sem.	I Lang (6)	II Lang (6)	Core (5)	Core Lab (4)	Allied Phy (4)	Allied Phy lab (2)	–	SBE (2)	Elec. EVS P[(1)	Total (30)	NCC/NSS/PED R.R/ Li.Sc. (3)	Com.Eng (2)	Comp.Lit (1)	–	SLC Law & Society
III Sem.	I Lang (6)	II Lang (6)	Core (5)	Core Lab (5)	Allied Maths (4)	–	–	NME (2)	SBE (2)	Total (30)	NCC/NSS/PED R.R/ Li.Sc. (3)	Com.Eng (2)	Comp.Lit (1)	–	SLC Human Rights
IV Sem.	I Lang (6)	II Lang (6)	Core (5)	Core lab (5)	Allied Maths (4)	–	–	NME (2)	SBE (2)	Total (30)	NCC/NSS/PED R.R/ Li.Sc. (3)	Com.Eng (2)	Comp.Lit (1)	–	SLC Client/Server Computing
V Sem.	Core (5)	Core (5)	Core Lab (6)	Core Lab (5)	Elec. (6)	–	–	SBE Major (2)	Elec. W.S. (1)	Total (30)	–	Com.Eng (2)	Comp.Lit (1)	Skill Devt – Career Guidance (3)	SLC Major Mobile Computing
VI Sem.	Core (5)	Core (5)	Core Lab (4)	Elec. (6)	Elec. Project (6)		–	SBE Major (2)	Elec. VBE (2)	Total (30)	–	Com.Eng (2)	Comp.Lit (1)	Skill Devt – Career Guidance (3)	–
	Total									**180**					

I Language – Tamil
II Language – English
SBE – Skill – Based Electives
SLC – Self – Learning Course
EVS – Environmental Studies
W.S. – Women Studies
VBE – Value Based Education

B.Sc IT: CHOICE BASED CREDIT SYSTEM WITH OBE PATTERN
FOR THOSE WHO HAVE JOINED FROM THE ACADEMIC YEAR 2021–22 ONWARDS

Part	Course	Subject	CODE	Hrs.	6th Hr.	Cr.	Adl. Cr.	Exam (Hrs)	Int.	Ext.
SEMESTER - I										
I	Lang. – I	Tamil – I	210103101	6		3		3	25	75
II	Lang. – II	English – I	211003101	6		3		3	25	75
III	Core	Python Programming	212603101	4		4		3	25	75
	Core	Multimedia	212603102	3		3		3	25	75
	Core Lab	Python Programming Lab	212603103	5		4		3	40	60
	Core Lab	Multimedia Lab	212603104	2		2		3	40	60
	All IT	Basics of IT	212603121	2		2		3	25	75
IV	SBE-I	Office Automation Lab	214403126	2		2		3	40	60
V	Extension activities	NSS / NCC / PED/Rover and Rangers/ Library Science and Information	-		3			–	–	–
Additional Credit Courses		Communicative English–I	–		2			–	–	–
		Computer Literacy	–		1			–	–	–
SEMESTER - II										
I	Lang. – I	Tamil – II	210103201	6		3		3	25	75
II	Lang. – II	English – II	211003201	6		3		3	25	75
III	Core	Data Structures	212603201	5		5		3	25	75
	Core Lab	Data Structures using C Lab	212603202	4		3		3	40	60
	All Phy	Digital Principles and applications	212103224	4		4		3	25	75
	All Phylab	Digital Electronics Practicals	212103225	2		2		3	40	60
IV	SBE-II	Professional Ethics	214403226	2		2		3	25	75
	EVS	Environmental Studies	214103201	1		1		2	–	100
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-		3			–	–	–
Additional Credit Courses		Communicative English – II	218003201		2		1	3	25	75
		Computer Literacy	-		1			–	–	–
		SLC-Intellectual Property Right	218003226				3	3	–	100
SEMESTER – III										
I	Lang. – I	Tamil – III	210103301	6		3		3	25	75
II	Lang. – II	English – III	211003301	6		3		3	25	75
III	Core	Programming in Java	212603301	4		4		3	25	75
	Core Lab	Programming in Java Lab	212603302	4		3		3	40	60
	Core Lab	Web Technology Lab	212603303	4		3		3	40	60
	Allied Maths	Discrete Mathematics	213103323	4		4		3	25	75
IV	NME – I	Fundamentals of IT	214603326	2		2		3	25	75
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-	-	3	-		–	–	–
Additional Credit Courses		Communicative English – II	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
		SLC-E-Waste Management	218003326				3	3	–	100

Part	Course	Subject	CODE	Hrs.	6th Hr.	Cr.	Adl. Cr.	Exam (Hrs)	Marks Int.	Marks Ext.
SEMESTER – IV											
I	Lang. – I	Tamil – IV	210103401	6		3		3	25	75
II	Lang. – II	English – IV	211003401	6		3		3	25	75
III	Core	Relational database Management System	212603401	4		4		3	25	75
	Core	Operating System	212603402	3		3		3	25	75
	Core Lab	Relational database Management System Lab	212603403	3		2		3	40	60
	Core Lab	Linux Lab	212603404	2		2		3	40	60
	Allied Maths	Resource Management Techniques	213103423	4		4		3	25	75
IV	NME - II	Multimedia	214603426	2		2		3	25	75
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-		3	1		3	25	75
Additional Credit Courses		Communicative English–II	218003401		2		1	3	25	75
		Computer Literacy	-		1			–	–	–
		SLC-Computer Organization	218003426				4	3	–	100
SEMESTER – V											
III	Core	.NET Programming	212603501	4		4		3	25	75
	Core	Android Programming	212603502	4		4		3	25	75
	Core	Mobile Computing	212603503	4		3		3	25	75
	Core Lab	.NET Lab	212603504	5		3		3	40	60
	Core Lab	Android Programming Lab	212603505	5		3		3	40	60
	Elective	Elective I	-		5	4		3	25	75
IV	SBE-III	Computer Graphics Lab	214403526	2		2		3	40	60
	WS	Women Studies	214503501	1		1		2	–	100
Additional Credit Courses		Communicative English–III	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
		Skill Development – Career Guidance	-		3			–	–	–
		SLC-Client-Server Computing	218003526				4	3	–	100
SEMESTER – VI											
III	Core	Software Engineering	212603601	4		3		3	25	75
	Core	Computer Networks	212603602	4		3		3	25	75
	Core	Data Mining with R programming	212603603	4		3		3	25	75
	Core Lab	Data Mining with R programming Lab	212603604	4		3		3	40	60
	Elective	Elective II	-		4	3		3	25	75
	Elective	Elective III: Project	212603607	6		5		–	40 [24:16]	60 [36:24]
IV	SBE-IV	Open Source Lab	214403626	2		2		3	40	60
	VBE	Value Based Education	214303601	2		2		2	–	100
Additional Courses		Communicative English–III	218003601		2		1	3	25	75
		Computer Literacy	218003602		1		1	3	–	100
		Skill Development – Career Guidance	218003603		3		2	3	–	100
		TOTAL		**180**	**36**	**140**	**20**			

Elective I :

        I.1. Computer Graphics - 212603506

        I.2. MANAGEMENT INFORMATION SYSTEM(MIS) - 212603507

Elective II :

        II.1. Advanced Computing Technologies - 212603605

        II.2. Computer Security - 212603606

Core Subject	**.NET PROGRAMMING**	Code: 212603501
	SEMESTER V	**4Hrs/Week**
		Credits 4

PREAMBLE:
- ✎ *This subject is designed to provide huge fundamental concepts of VB.Net, C#.Net and ASP.Net Programming.*
- ✎ *It focuses on ADO.Net, Microsoft's new technology for retrieving and managing disconnected data.*
- ✎ *Using web services we can create code runtime and access them other applications using open standard such as SOAP, XML.*

COURSE OUTCOMES (COs)
On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Learn the knowledge about basic concepts about VB.NET, C#,ASP.Net	Up to K3
CO2	Understand about Web Form Fundamentals & web_Controls	Up to K3
CO3	Apply about Overview of ADO.NET ADO.NET Data Access	Up to K3
CO4	Analyze the concept of Data Binding and data control	Up to K3
CO5	Evaluate the concept of Files ,Streams, and E-mail and Web Services	Up to K3

K1- Knowledge   K2 – Understand   K3-Apply

UNIT - I   **[12 Hrs]**
The .NET Frame work: VB.NET, C#, and the .NET Languages - The common Language Runtime - The .NET Class Library - ASP.NET - visual Studio.NET

Learning the .NET Languages: The.NET languages - Data Types-Declaring Variables-scope and accessibility -Variable Operations - Object based Manipulation - conditional structures - Loop Structures - Functions and subroutines

UNIT - II   **[12 Hrs]**
Web Form Fundamentals: A Simple Page Applet-Improving the Concurrency Converter-A Deeper Look at html control classes- Page class-Accessing HTML Server Controls

Web Controls: stepping up to Web controls-Web control classes-Auto post Back and Web Control Events- A Simple web Page Applet- Accessing Web Controls.

 UNIT - III   **[12 Hrs]**
Overview of ADO.NET: Introducing ADO.NET -Characteristics of ADO.NET-The ADO.NET Object model

ADO.NET Data Access: -SQL Basics- The SQL Select statement- The SQL update statement- The SQL Insert statement- The SQL Delete statement-Accessing Data the easy way-Creating a connection-Defining a Select Command- Using a Command with a Data reader-Updating Data-Accessing

Disconnected data- Selecting Multiple Tables-Modifying Disconnected Data-Updating Disconnected data.

UNIT - IV   **[12 Hrs]**

Data Binding: Introducing data binding-single value data binding-repeated value data binding-data binding with data bases.

The Data list, Data grid and Repeater: Introducing templates-using templates with the data list-data binding with multiple templates-comparing the template controls.

UNIT - V   **[12 Hrs]**

Files ,Streams, and E-mail: Files and web applications-File system information-Reading and writing with streams-Allowing file uploads-Sending mail.

Web Services: Web services Architecture: Internet programming Then and Now-WSDL –SOAP-Communicating with web service-Web service discovery and UDDI.

TEXT BOOK:
01. "The Complete Reference ASP.NET", **Matthew MacDonald**, TATA McGraw Hill ,New Delhi, 2001.

Unit	Chapters
I	1[Pg.No.3-13],2[Pg.No :15-50]
II	6[Pg.No;139-170], 7[Pg.No:171-207]
III	12[*Pg.No:353-371], 13[Pg.No:373-420]*
IV	14[*Pg.No:421-448],15[Pg.No:449-475]*
V	16[Pg.No:495-524],18[Pg.No:565-579]

REFERENCES:
01. Rajkamal ,"Web Technology", Tata McGraw – Hill, New Delhi, 2020.
02. P. Radhaganesan, "VB.NET", SCITECH Publication (INDIA) pvt. Ltd.2020
03. Nitni Pandey, Yesh Singhal, Mridula, "Visual Studio.Net Programming", Wiley Dream TechIndia (p) Ltd, 2002

WEB RESOURCES:
01. https://www.tutorialspoint.com/VB.Net
02. https://www.javatpoint.com/ ASP.Net -/tutorial
03. https://www.geeksforgeeks.org/ ASP.Net /
04. https://www.tutorialandexample.com/C#.Net

PEDAGOGY: Chalk & Talk, PPT Presentation, Group Discussion, Tutorials.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	VB.NET, C#, and the .NET Languages	1	Chalk & Talk	Black Board
1.2	The common Language Runtime	1	Chalk & Talk	Black Board
1.3	The .NET Class Library	1	Chalk & Talk	Black Board
1.4	ASP.NET	1	Chalk & Talk	Black Board
1.5	visual Studio.NET	1	Chalk & Talk	Black Board
1.6	The.NET languages	1	Chalk & Talk	Black Board

1.7	Data Types-Declaring Variables	1	PPT presentation	projector
1.8	scope and accessibility	1	PPT presentation	projector
1.9	Variable Operations	1	PPT presentation	projector
1.10	Object based Manipulation	1	PPT presentation	projector
1.11	Loop Structures	1	PPT presentation	projector
1.12	Functions and subroutines	1	PPT presentation	projector
UNIT – II [12 Hrs]				
2.1	A Simple Page Applet	1	Chalk & Talk	Black Board
2.2	Improving the Concurrency Converter	1	PPT presentation	projector
2.3	A Deeper Look at html control classes	1	Chalk & Talk	Black Board
2.4	Page class	1	PPT presentation	projector
2.5	Accessing HTML Server Controls	1	PPT presentation	projector
2.6	stepping up to Web controls	1	PPT presentation	projector
2.7	Auto post Back and Web Control Events	2	Chalk & Talk	Black Board
2.8	A Simple Web Page Applet	2	Chalk & Talk	Black Board
2.9	Accessing Web Controls	2	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Introducing ADO.NET	1	Chalk & Talk	Black Board
3.2	Characteristics of ADO.NET	1	Chalk & Talk	Black Board
3.3	The ADO.NET Object model	1	PPT presentation	projector
3.4	SQL Basics& SQL Select statement	1	PPT presentation	projector
3.5	The SQL Insert& update statement	1	PPT presentation	projector
3.6	The SQL Delete statement& Accessing Data the easy way	1	PPT presentation	projector
3.7	Creating a connection	1	PPT presentation	projector
3.8	Using a Command with a Data reader	1	PPT presentation	projector
3.9	Updating Data	1	PPT presentation	projector
3.10	Accessing Disconnected data	1	PPT presentation	projector
3.11	Selecting Multiple Tables	1	PPT presentation	projector
3.12	Modifying & Updating Disconnected Data	1	PPT presentation	projector
UNIT – IV [12 Hrs]				
4.1	Introducing data binding	1	Chalk & Talk	Black Board
4.2	single value data binding	1	Chalk & Talk	Black Board
4.3	repeated value data binding	2	PPT presentation	projector
4.4	.The Data list, Data grid and Repeater: introducing templates	2	PPT presentation	projector

4.5	Using templates with the data list	2	PPT presentation	projector
4.6	Data binding with multiple templates	2	PPT presentation	projector
4.7	Comparing the template controls.	2	PPT presentation	projector
UNIT – V [12 Hrs]				
5.1	Files and web applications	1	Chalk & Talk	Black Board
5.2	File system information	1	PPT presentation	projector
5.3	File system information	1	PPT presentation	projector
5.4	Allowing file uploads	1	PPT presentation	projector
5.5	Sending mail	1	PPT presentation	projector
5.6	Internet programming Then and Now	1	PPT presentation	projector
5.7	WSDL	2	PPT presentation	projector
5.8	SOAP	1	PPT presentation	projector
5.9	Communicating with web service	1	PPT presentation	projector
5.10	Web service discovery and UDDI	2	PPT presentation	projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	3	3	3	2	2
CO4	3	3	2	3	2
CO5	3	3	2	2	3

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Ms. A.PASUMPON

****

Core Subject	**ANDROID PROGRAMMING**	Code: 212603502

SEMESTER V   **4 Hrs/Week**

Credits 4

PREAMBLE:
   - ✍ *Understand the architecture of android operating system for mobile devices.*
   - ✍ *Gain Knowledge to create simple Android application.*
   - ✍ *Make the students to understand the features of Android.*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Understand the basics of Android including Android operating system and configuration of Android	Up to K3
CO2	Describe the configuration of Android environment	Up to K3
CO3	Understand the components of Android user interface and able to create simple Android application	Up to K3
CO4	Gain Knowledge to design user interface	Up to K3
CO5	Explain the Android system architecture	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT - I: **[12 Hrs]**

Introduction to Android OS: Android Description-Open Handset Alliance-Android Ecosystem-Android Version- Features of Android-Android Architecture-Stack Linux Kernel

UNIT - II: **[12 Hrs]**

Configuration of Android Environment: Operating System –Java JDK-Android SDK-Android Development Tools(ADT)-Android Virtual Devices(AVDs)-Dalvik Virtual Machine-Difference between JVM and DVM-Steps to install and Configure Eclipse and SDK.

UNIT - III: **[12 Hrs]**

Create the first android application: Directory Structure-Android User Interface:-Understanding the components of a screen-Linear Layout-Absolute Layout-Frame Layout-Relative Layout.

UNIT - IV: **[12 Hrs]**

Designing User Interface with View: Text View-Button-Image Button-Edit Text-Check Box -Radio Button and Radio Group-Progress Bar-Auto complete Text View-Spinner-List View-Grid View-Image View-Scroll View-Custom Toast-Time and Date Picker.

UNIT - V: **[12Hrs]**

Activity: Introduction-Intent-Intent Filter-Activity Life cycle-Service-Broadcast Life cycle-Service. Multimedia Android System Architecture-Play Audio and Video

TEXT BOOK:
  01.Prasanna Kumar Dixit,"Android", Vikas Publishing House Private Ltd.,Noida,2014

UNIT	CHAPTERS
I	1.1,1.2,1.3,1.5,1.7,1.8.1.9
II	2.1,2.2,2.3,2.4,2.5,2.7,2.8,2.9
III	3.1,4.11,4.12,4.13,4.14
IV	5.1-5.3,5.7-5.16
V	6.1,6.2,6.3,6.4,6.5,7.1,7.2,7.3

REFERENCE:
  01. Reto Meier and Wrox Wiley,: Professional Android 4 Application Develpoment:, 2012.
  02.ZiguradMednieks, LaridDornin, G.BlakeMeike, Masumi Nakamura, "Programming Andriod", O'Reilly,2013.
  03.Robert Green, Mario Zechner, "Beginning Android 4 Games Development", Apress Media LLC, New York, 2011.

WEB RESOURCES:
  01. https://www.javapoint.com/android-tutorial.
  02. https://developer.android.com/gide.
  03. https://developer.android.com/training/basics/firstapp

PEDAGOGY: Chalk and Talk, Power point presentation, and Group discussion.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	**Introduction:** Introduction to android	1	Chalk & Talk	Black Board
1.2	Android Description	1	PPT	LCD Projector
1.3	Open Handset Alliance	1	PPT	LCD Projector
1.4	Android Eco system	1	PPT	LCD Projector
1.5	Android Version	2	PPT	LCD Projector
1.5	Android Architecture	2	Chalk & Talk	Black Board
1.6	Features of android	1	Chalk & Talk	Black Board
1.7	Android Architecture	2	Chalk & Talk	Black Board
1.8	Stack Linux Kernel	1	Chalk & Talk	Black Board
UNIT – II [12 Hrs]				
2.1	Configuration of Android Environment Introduction	1	PPT	LCD Projector
2.2	Operating System	1	PPT	LCD Projector
2.3	Java JDK-	1	PPT	LCD Projector
2.4	Android SDK	1	PPT	LCD Projector
2.5	Android Development Tools(ADT)	2	Chalk & Talk	Black Board
2.6	Android Virtual Devices(AVDs)	2	Chalk & Talk	Black Board
2.7	Dalvik Virtual Machine	1	Chalk & Talk	Black Board
2.8	Difference between JVM and DVM	1	Chalk & Talk	Black Board
2.9	Steps to install and Configure Eclipse and SDK.	2	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Create the first android application Introduction	1	Chalk & Talk	Black Board
3.2	Directory Structure	2	PPT	Projector
3.3	Android User Interface Introduction	2	Chalk & Talk	Black Board
3.4	Understanding the components of a screen	2	PPT	Projector
3.5	Linear Layout-Absolute Layout-Frame Layout-Relative Layout.	5	PPT	Projector
UNIT – IV [12 Hrs]				
4.1	Designing User Interface with View	1	Chalk & Talk	Black Board
4.2	Text View-Image Button-Button-Image Button	1	PPT	Projector
4.3	Edit Text	1	PPT	Projector
4.4	Check Box	1	PPT	Projector
4.5	Radio Button and Radio Group	2	PPT	Projector
4.6	Progress Bar	1	PPT	Projector
4.7	Auto complete Text View-Spinner-List View-Grid View-Image View-Scroll View	3	PPT	Projector
4.8	Custom Toast-Time and Date Picker.	2	PPT	Projector
UNIT – V [12 Hrs]				
5.1	Activity Introduction	1	Chalk & Talk	Blackboard
5.2	Intent-Intent Filter	2	PPT	Projector
5.3	Activity Life cycle	2	PPT	Projector
5.4	Broadcast Life cycle-Service	2	PPT	Projector

| 5.5 | Multimedia Android System Architecture | 3 | PPT | Projector |
| 5.6 | Play Audio and Video | 2 | PPT | Projector |

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2
CO2	3	3	3	2	2
CO3	3	2	3	2	2
CO4	3	3	2	3	2
CO5	2	2	3	2	2

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Ms.P.NANTHINI

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Core Subject	**MOBILE COMPUTING**	Code:212603503

SEMESTER V   **4 Hrs/Week**
Credits 3

PREAMBLE:
- ? *To learn about the concepts and principles of mobile computing.*
- ? *To explore both theoretical and practical issues of mobile computing.*
- ? *To develop skills of finding solutions and building software for mobile computing applications*

COURSE OUTCOMES (COs)
On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Grasp the concepts and features of mobile computing technologies and applications.	Up to K3
CO2	Understand how the underlying wireless and mobile communication networks work.	Up to K3
CO3	Identify the important issues of developing mobile computing systems and applications.	Up to K3
CO4	Organize the functionalities and components of mobile computing systems	Up to K3
CO5	Develop mobile computing applications by analyzing their characteristics and requirements, selecting the appropriate computing models and software architectures	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT-I   **[12 hrs]**
INTRODUCTION: Mobile Computing - Mobile Computing Vs Wireless
Networking -
Mobile Computing Applications -Characteristics of Mobile computing -
Structure of Mobile
Computing Application. MAC Protocols -Wireless MAC Issues -Fixed
Assignment Schemes -
Random Assignment Schemes -Reservation Based Schemes.

UNIT-II   **[12 hrs]**
MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER: Overview of
Mobile IP-Features of Mobile IP -Key Mechanism in Mobile IP -route
Optimization-Overview of TCP/IP -Architecture of TCP/IP- Adaptation of TCP
Window -Improvement inTCP Performance.

UNIT-III   **[12 hrs]**
MOBILE TELECOMMUNICATION SYSTEM: Global System for
MobileCommunication (GSM)-General Packet Radio Service (GPRS) -Universal
MobileTelecommunication System (UMTS).

UNIT-IV [12 hrs]
MOBILE AD-HOC NETWORKS: Ad-Hoc Basic Concepts -Characteristics - Applications - Design Issues -Routing - Essential of Traditional Routing Protocols – PopularRouting Protocols -Vehicular Ad Hoc networks (VANET) - MANET Vs VANET - Security.

UNIT-V [12 hrs]
MOBILE PLATFORMS AND APPLICATIONS: Mobile Device Operating Systems -Special Constrains & Requirements - Commercial Mobile Operating Systems -Software Development Kit: IOS, Android, BlackBerry, Windows Phone -M-Commerce -Structure -Pros & Cons - Mobile Payment System - Security Issues.

TEXT BOOK:
1. "Fundamentals of Mobile Computing" Prasant Kumar Pattnaik, Rajib Mall , PHI Learning Pvt. Ltd, New Delhi 2012

REFERENCES:
01. Jochen H. Schller, "Mobile Communications", Second Edition, Pearson Education, New Delhi, 2007.
02. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.
03. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 2003.

WEB RESOURCES:
01. https://www.javatpoint.com/bluetooth-technology-in-mobile-computing
02. https://www.tutorialspoint.com/wireless_communication/wireless_communication_terms_in_mobile_telephony.htm

PEDAGOGY: Chalk and Talk, Power point presentation, and Group discussion.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT –I [12 hrs]				
1.1	**Introduction:**Mobile Computing - Mobile Computing Vs Wireless Networking - Mobile Computing Applications	3	Chalk & Talk	Black Board
1.2	Characteristics of Mobile computing - Structure of Mobile Computing Application. MAC Protocols	3	Chalk & Talk	Black Board
1.3	Wireless MAC Issues -Fixed Assignment Schemes	3	PPT presentation	Projector
1.4	Random Assignment Schemes -Reservation Based Schemes.	3	PPT presentation	Projector
UNIT – II [12 hrs]				
2.1	**MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER:** Overview of Mobile IP-Features of Mobile IP	2	Chalk & Talk	Black Board
2.2	Key Mechanism in Mobile IP -route Optimization	3	Chalk & Talk	Black Board
2.3	Overview of TCP/IP -Architecture of TCP/IP	3	Chalk & Talk	Black Board
2.4	Adaptation of TCP Window -	2	Chalk & Talk	Black Board
2.5	Improvement inTCP Performance	2	Chalk & Talk	Black Board
UNIT – III [12 hrs]				
3.1	**EMERGINGTECHNOLOGIES: MOBILETELECOMMUNICATION SYSTEM:** Global System for MobileCommunication (GSM)	4	Chalk & Talk	Black Board

3.2	General Packet Radio Service (GPRS)	4	PPT presentation	Projector
3.3	Universal MobileTelecommunication System (UMTS).	4	PPT presentation	Projector
UNIT - IV [12 hrs]				
4.1	**MOBILE AD-HOC NETWORKS:** Ad-Hoc Basic Concepts -Characteristics - Applications	4	PPT presentation	Projector
4.2	Design Issues -Routing - Essential of Traditional Routing Protocols-Popular Routing Protocols -	4	PPT presentation	Projector
4.3	Vehicular Ad Hoc networks (VANET) - MANET Vs VANET - Security.	4	PPT presentation	Projector
UNIT - V [12 hrs]				
5.1	**MOBILE PLATFORMS AND APPLICATIONS:** Mobile Device Operating Systems -Special Constrains & Requirements	3	PPT presentation	Projector
5.2	Commercial Mobile Operating Systems - Software Development Kit: IOS, Android	3	PPT presentation	Projector
5.3	BlackBerry, Windows Phone	2	PPT presentation	Projector
5.4	M-Commerce -Structure -Pros & Cons - Mobile Payment System -Security Issues.	4	PPT presentation	Projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	3	1
CO3	3	3	3	2	2
CO4	3	3	2	3	1
CO5	3	3	3	2	3

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr.K.Vetrivel

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Core Lab	**.NET LAB**	**Code: 212603504**
	SEMESTER V	**5 Hrs/Week**
		Credits 3

PREAMBLE:
- ✍ *Students learn about various basic concepts of dot net technologies*
- ✍ *To implement dot net program into ADO.Net technologies like VB.Net, C#.Net,ASP.Net .*

Simple Programs

1. Write a VB.NET Program to Generate Multiplication Table.
2. Write a VB.NET Program to Generate an Adam Number Series between the given limits.
3. Write a VB.NET Program to Generate an Prime Number Series between the given limits.
4. Write a VB.NET Program to Generate an Armstrong Number Series between the given limits.
5. Write a C#.NET Program to Calculate the area of Various Objects.
6. Write a C#.NET Program to find Sum of digits and reverse the given number.
7. Write a VB.NET Program to find NCR Value of a given number.
8. Write a VB.NET Program to design a Scientific Calculator.
9. Write a VB.NET Program to develop a Quiz Application.
10. Write a VB.NET Program to generate a bill for a bouquet shop.
11. Write a VB.NET Program to calculate simple and Compound interest using DropDown List Box.

12. Write a VB.NET Program to Create a Text Editor Using MDI Application.

DataBase Programs

1. Write a ASP.NET Program to Generate a Student Data Processing.
2. Write a ASP.NET Program to Generate a Telephone Data Processing.
3. Write a ASP.NET Program to Generate a Employee Data Processing.
4. Write a C#.NET Program to Generate a Electricity Bill Data Processing.
5. Write a C#.NET Program to Generate a Inventory Control.

REFERENCES:

01. Jeffrey R. Shapiro, The Complete Reference Visual Basic .NET, TATA McGraw – Hill Edition, Delhi, 2002.
02. Rajkamal ,"Web Technology", Tata McGraw – Hill, New Delhi ,2020.
03. P. Radhaganesan, "VB.NET", SCITECH Publication (INDIA) pvt. Ltd.2020.
04. Nitni Pandey, Yesh Singhal, Mridula. "Visual Studio.Net Programming", Wiley Dream TechIndia (p) Ltd, 2002.
05. "The Complete Reference ASP.NET", Matthew MacDonald, TATA McGraw Hill ,New Delhi, 2001.

WEB RESOURCES:

01. https://www.w3schools.com/asp.net/
02. https://www.w3schools.com/vbe.net/
03. https://www.w3schools.com/c#.net/
04. https://www.tutorialspoint.com/ebook/asp.net_tutorial/index.asp
05. https://www.tutorialspoint.com/learn_my_sql_for_beginners/index.asp

COURSE DESIGNER: Ms. A.PASUMPON
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Core Lab	ANDROID PROGRAMMING LAB	Code: 212603505
	SEMESTER V	5 Hrs/Week
		Credits 3

PREAMBLE:

- *To do simple programs Android*
- *Make the students to create ,compile, and execute Android Programs using toast messages.layouts,and so on .*

01. Write an Android Program to Perform Arithmetic Operation.

02. Write an Android Program to Change the Background Color of the Screen.

03. Write an Android Program to Perform Prime Number Checking.

04. Write an Android Program to Calculate Sum of Digit

05. Write an Android Program to Calculate Simple Interest.

06. Write an Android Program to Perform Palindrome Number checking.

07. Write an Android Program to Design a Login Page.

08. Write an Android Program to Perform Online quiz.

09. Write an Android Program to print the set of alphabets/strings in a linear Layout.

10. Write an Android Program to demonstrate scroll view and list view.

11. Write an Android program to Working with animation.

12. Write an Android program to demonstrate Date Picker Dialog Time Picker Dialog with current date and current running time.

13. Write an Android Program to Perform Text Operation.

14. Write an Android Program to Perform String Operation.

15. Write an Android Program to Perform implementation of Check Box.

16. Write an Android Program to Perform Image Gallery.

17. Write an Android Program to Display Count –Down Timer

REFERENCE BOOKS:

01. Prasanna Kumar Dixit,"Android", Vikas Publishing House Private Ltd., Noida, 2014.
02. Reto Meier and Wrox Wiley,: Professional Android 4 Application Development:, 2012.
03. ZiguradMednieks, LaridDornin, G.BlakeMeike, Masumi Nakamura, "Programming Andriod", O'Re2illy,2013.
04. Robert Green, Mario Zechner, "Beginning Android 4 Games Development", Apress Media LLC, New York, 2011.

WEB RESOURCES:

01. https://www.javapoint.com/android-tutorial.
02. https://developer.android.com/gide.
03. https://developer.android.com/training/basics/firstapp

COURSE DESIGNER: Ms.P.NANTHINI

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Elective Major - I	**I.1 COMPUTER GRAPHICS**	Code: 212603506

SEMESTER V   **5 Hrs/Week**
Credits 4

PREAMBLE:
- ✍ *This subject is designed to provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.*
- ✍ *Students learn about various Algorithms and Transformation Techniques used in Computer Graphics.*
- ✍ *Enable students to apply Computer Animation Techniques in their profession.*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Get introduced to Computer Graphics system and its applications.	Up to K3
CO2	Learn Output Primitives and Attributes of Computer Graphics system.	Up to K3
CO3	Understand Two Dimensional Geometric Transformations.	Up to K3
CO4	Recognize Two Dimensional Viewing and Clipping operations	Up to K3
CO5	Get acquainted with Computer Animation Techniques	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT - I: **[15 Hrs]**

Introduction and Overview of Graphics Systems : Computer Aided Design- Computer Art- Education and Training- Image Processing – Graphical User Interface- Video Display Devices- Raster Scan Systems- Random Scan Systems- Input Devices.

UNIT - II: **[15 Hrs]**

Output Primitives and Attributes: Points and Lines- Line Drawing Algorithms - Line Function- Circle Generating Algorithms - Line Attributes- Curve Attributes- Color and Gray scale Levels - Bundled Attributes.

UNIT - III: **[15Hrs]**

Two Dimensional Geometric Transformations: Basic Transformation – Matrix Representations- Composite Transformation- Other Transformation - Affine Transformation -Transformation Functions.

UNIT - IV: **[15 Hrs]**

Two Dimensional Viewing: The Viewing Pipeline- Viewing Co-ordinates Reference Frame- Window to Viewport Co-ordinate Transformation-Two Dimensional Viewing Functions - Clipping Operations-Point Clipping- Line Clipping: Cohen Sutherland Line Clipping- Polygon Clipping: Sutherland – Hodgeman Polygon Clipping- Curve Clipping-Text Clipping- Exterior Clipping.

 UNIT - V: **[15 Hrs]**

Computer Animation: Design of Animation Sequences – General Computer animation Functions – Raster Animations – Computer Animation Languages – Key-Frame Systems – Motion Specifications.

 TEXT BOOK:

01.Donald Hearn & M Pauline Baker. "Computer Graphics C Version". PHI, Second Edition, New Delhi.

Unit	Chapters
I	1.1, 1.3, 1.5, 1.7, 1.8, 2.1, 2.2, 2.3, 2.5
II	3.1, 3.2, 3.4, 3.5, 4.1, 4.2, 4.3, 4.6
III	5.1, 5.2, 5.3, 5.4, 5.6, 5.7
IV	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 (Pg.No.245-250) 6.8 (Pg.No.257-262), 6.9 , 6.10
V	16.1, 16.2, 16.3, 16.4, 16.5, 16.6

REFERENCES:
01. R. G .S Asthana and N. K. Sinha. "Computer Graphics For Scientists And Engineers". New Age International Pvt. Ltd. New Delhi.2001.
02. Steven Harrington. "Computer Graphics: A Programming Approach". Tata McGraw-Hill Companies, Second Edition, New Delhi.
03. William M. Newman and Robert F.Sproull." Principles of Interactive Computer Graphics". Tata McGraw-Hill, 1986.

WEB RESOURCES:
01.https://www.tutorialspoint.com/computer_graphics/computer_graphics_useful_resources.html
02.https://www.javatpoint.com/computer-graphics-tutorial
03.https://www.geeksforgeeks.org/computer-graphics-2/
04.https://www.tutorialandexample.com/computer-graphics-tutorial

PEDAGOGY: Chalk & Talk And PPT presentation

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [15 Hrs]				
1.1	Computer Graphics Introduction	1	Chalk & Talk	Black Board
1.2	Computer Aided Design	1	Chalk & Talk	Black Board
1.3	Education and Training	1	Chalk & Talk	Black Board
1.4	Image Processing	1	Chalk & Talk	Black Board
1.5	Computer Art	1	Chalk & Talk	Black Board
1.6	Graphical User Interface	1	Chalk & Talk	Black Board
1.7	Video Display Devices	3	PPT	projector
1.8	Raster Scan Systems	2	PPT	projector
1.9	Random Scan Systems	2	PPT	projector
1.10	Input Devices	2	PPT	projector
UNIT – II [15 Hrs]				
2.1	Points and Lines	1	Chalk & Talk	Black Board
2.2	Line Drawing Algorithms	4	PPT	projector
2.3	Line Function	1	Chalk & Talk	Black Board
2.4	Circle Generating Algorithms	3	PPT	projector
2.5	Line Attributes	1	PPT	projector
2.6	Curve Attributes	1	PPT	projector
2.7	Color and Gray scale Levels	2	Chalk & Talk	Black Board
2.8	Bundled Attributes	2	Chalk & Talk	Black Board
UNIT – III [15 Hrs]				
3.1	Basic Transformation	3	Chalk & Talk	Black Board
3.2	Matrix Representations	3	Chalk & Talk	Black Board
3.3	Composite Transformation	3	PPT	projector
3.4	Other Transformation	3	PPT	projector
3.5	Affine Transformation	1	PPT	projector
3.6	Transformation Functions	2	Chalk & Talk	Black Board
UNIT – IV [15 Hrs]				
4.1	The Viewing Pipeline	1	Chalk & Talk	Black Board
4.2	Viewing Co-ordinates Reference Frame	1	Chalk & Talk	Black Board
4.3	Window to Viewport Co-ordinate Transformation	2	PPT	projector
4.4	Two Dimensional Viewing Functions	2	PPT	projector
4.5	Clipping Operations	1	PPT	projector
4.6	Point Clipping	1	PPT	projector
4.7	Line Clipping: Cohen Sutherland Line Clipping	2	PPT	projector
4.8	Polygon Clipping: Sutherland – Hodgeman Polygon Clipping	2	PPT	projector
4.9	Curve Clipping	1	Chalk & Talk	Black Board
4.10	Text Clipping	1	Chalk & Talk	Black Board
4.11	Exterior Clipping	1	Chalk & Talk	Black Board
UNIT – IV [15 Hrs]				
5.1	Design of Animation Sequences	2	Chalk & Talk	Black Board
5.2	General Computer animation Functions	3	PPT	projector
5.3	Raster Animations	2	PPT	projector
5.4	Computer Animation Languages	3	PPT	projector
5.5	Key-Frame Systems	3	PPT	projector
5.6	Motion Specifications	2	PPT	projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	3	3	3	2	2
CO4	3	3	2	3	2
CO5	3	3	2	2	3

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Ms. T.CHITRA DEVI

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Elective-I   1.2 MANAGEMENT INFORMATION SYSTEM   Code: 212603507

SEMESTER V   5 Hrs/Week

Credits 4

Preamble:
- ✎ *To inculcate the knowledge about the social and ethical issues in MIS.*
- ✎ *To know more about the current technologies in MIS.*
- ✎ *To deliver the knowledge about the applications of Ecommerce and MIS.*
- ✎ *To apply the MIS techniques for real time decision making.*
- ✎ *To enhance the MIS applications by applying in the International/Global systems*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Introduction about the social and ethical issues in MIS	Up to K3
CO2	Knowledge about the various current technologies in MIS	Up to K3
CO3	Understand the various applications of Ecommerce and MIS	Up to K3
CO4	Application of MIS techniques in real time problems	Up to K3
CO5	Application of MIS techniques in International and global problems	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT - I: **[15 Hrs]**

Information Systems in Global Business Today - Information Systems, Organizations, and Strategy- Ethical and Social Issues in Information Systems.

UNIT - II: **[15 Hrs]**

IT Infrastructure and Emerging Technologies- Foundations of Business Intelligence- Databases and Information Management: Telecommunications, the Internet, and Wireless Technology .

UNIT - III: **[15 Hrs]**

Achieving Operational Excellence and Customer Intimacy: Enterprise Applications - E-Commerce: Digital Markets, Digital Goods .

UNIT - IV: **[15 Hrs]**

Managing Kno6wledge- Enhancing Decision Making.

UNIT - V: **[15 Hrs]**

Building Information Systems- Managing Projects -Managing Global Systems .

TEXT BOOK:

01. Kenneth C. Laudon ,Jane P. Laudon "Management Information Systems- Managing the digital firm" ,13th Edition ,Global Edition, Pearson Education Publication,2014.

Unit	Chapters
I	1,3,4

II	5,6,7
III	9,10
IV	11,12
V	13,14,15

REFERENCES:

01. Pravesh Kumar Singh , Dileep Singh , Management Information System, Thakur Publications Private Limited, Lucknow.
02. Dr.A.K.Gupta , Management Information Systems, S.Chand Publications , A division of S.Chand & company Limited , 7361 ,Ram Nagar, New Delhi 110055.
03. S.Shajahan, R. Priyadharshini , Management Information Systems , New Age International Publications

WEB RESOURCES:

01. https://csvs.libguides.com
02. https://guides.library.ubc.ca
03. https://bookauthority.org
04. https://library.ncu.edu
05. https://www.sctevtservices.nic.in

PEDAGOGY: Chalk and Talk, Power Point Presentation, Group Discussion ,Tutorials.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No.of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [15 Hrs]				
1.1	Information Systems in Global Business today	5	Chalk & Talk	Black Board
1.2	Information Systems, Organizations and Strategy	5	Chalk & Talk	Black Board
1.3	Ethical and social issues in Information Systems	5	Chalk & Talk	Black Board
UNIT – II [15 Hrs]				
2.1	IT Infrastructure and Emerging Technologies	5	PPT	Projector
2.2	Foundations of Business Intelligence	5	PPT	Projector
2.3	Databases and Information Management-Telecommunications, the Internet, and Wireless Technology	5	Chalk & Talk	Black Board
UNIT – III [15 Hrs]				
3.1	Achieving Operational Excellence and Customer Intimacy: Enterprise Applications	8	PPT	Projector
3.2	E-Commerce: Digital Markets, Digital Goods	7	Chalk & Talk	Black Board
UNIT – IV [15 Hrs]				
4.1	Managing Knowledge	8	PPT	Projector
4.2	Enhancing Decision Making	7	Chalk & Talk	Black Board
UNIT – V [15 Hrs]				
5.1	Building Information Systems	5	Chalk & Talk	Black Board
5.2	Managing Projects	5	PPT	Projector
5.3	Managing Global Systems	5	Chalk & Talk	Black Board

MAPPING OF COs WITH POS

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	3	3	3	2	2
CO4	3	3	2	3	2
CO5	3	3	2	2	3

Strong – 3   Medium – 2   Low – 1

COURSE DESIGNER: Ms. V.PANDIAMMAL
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Part IV	**COMPUTER GRAPHICS LAB**	Code: 214403526
Skill Based Elective-III Lab	SEMESTER V	**2 Hrs/Week**

Credits 2

PREAMBLE:
- ✍ *Students learn about various Algorithms and Transformation Techniques used in Computer Graphics.*
- ✍ *Enable students to apply Computer Animation Techniques in their profession.*

1. Fundamental Graphics Functions.

2. DDA Line Drawing Algorithm

3. Bresenham's Line Drawing Algorithm.

4. Bresenham's Circle Drawing Algorithm.

5. Midpoint Circle Algorithm

6. Line Clipping Program.

7. Polygon Clipping Program.

8. 2D Animation Computer Graphics Programs.

9. 3D Animation Computer Graphics Programs.

10. Text Animation Program.

REFERENCES:

01. Donald Hearn & M Pauline Baker."Computer Graphics C Version ". PHI, Second Edition, New Delhi.
02. R. G .S Asthana and N. K. Sinha. "Computer Graphics For Scientists And Engineers". New Age International Pvt. Ltd. New Delhi.2001.
03. Steven Harrington. "Computer Graphics: A Programming Approach". Tata McGraw-Hill Companies, Second Edition, New Delhi.

WEB RESOURCES:

1. https://www.thiyagaraaj.com/tutorials/computer-graphics-programs-using-c-programming
2. https://www.tutorialspoint.com/computer_graphics/computer_graphics_useful_resources.html
3. https://www.tutorialandexample.com/computer-graphics-tutorial

COURSE DESIGNER: Ms. T.CHITRA DEVI
****

Self Learning Course–Major   CLIENT/SERVER COMPUTING

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SEMESTER V   **Code: 218003526**

Addl. Credits 4

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PREAMBLE:
- ✍ *Make students to understand the client and server concepts.*
- ✍ *Understand the role of client and server and their functionalities.*
- ✍ *Know about the hardware, software, and methods in client/server applications*

UNIT I:

Introduction:

To CLIENT/SERVER Computing – Mainframe Centric Client/Server Computing – Downsizing and Client/Server Computing – Advantages of Client/Server Computing- Connectivity – User Productivity – Ways to improve Performance - How to reduce network traffic – Faster Delivery of Systems

UNIT II:

Components of Client/Server applications – The client: The role of the client – client services – Request for services –Components of Client/Server Application –

Server: The role of the server – Server functionality in detail – The network operating system –The server operating system.

UNIT III:

Components of Client/Server Application – Connectivity: open system interconnect – Communications interface technology – Inter process Communication – WAN technology

UNIT IV:

Client/Server Systems development – software: Need for platform migration and re-engineering of existing systems – Need for common interface across platforms - Client/Server systems development methodology – systems development environment. Client/Server systems development – Hardware: pc level processing units – UNIX workstation - Data storage – Network interface cards.

UNIT V:

Client/Server systems development – Service and Support : system administration – Availability – Reliability – Serviceability – performance – Network management – Remote system management – Security – LAN and Network management issues : training advantages of GUI application – System administrator training – Database administrator training – End-User training.

TEXT BOOK:

01. "Client/Server Computing" by Patrick N.Smith and Steven L.Guengerich, second edition, A Prentice hall of India private limited, New Delhi.

REFERENCES:

01. "Client/Server Computing" by Dawna Travis Dewire, MCGraw-Hill, Inc.

02.Subash Chandra Yadav, Sanjay Kumar Singh, "An Introduction to Client/Server Computing", New Age International Publishers, New Delhi, 2009.

WEB RESOURCES:

01.https://www.academia.edu/32301297/Client_Server_Computing_by

02.https://pdfs.semanticscholar.org/fe8c/ca2f103875e09a3f7ca72e1542c4022f0729.pdf

03.https://dde-ac.in/Books/C132.pdf

04.http://aagasc.edu.in/cs/books/client-server-computing.pdf

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Core Subject	**SOFTWARE ENGINEERING**	Code: 212603601
	SEMESTER VI	**4 Hrs/Week**
		Credits 3

PREAMBLE:

? *To study various Software Engineering Lifecycle Models and Resource Estimation Techniques used in the development of software.*

? *To learn various Analysis, Design and Development Principles required for modeling software.*

? *To study about the process of Software Testing, Quality Assurance, Configuration Management and Software Maintenance.*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Understand the basics of software engineering including life cycle models, and organizational structures.	Up to K3
CO2	Examine the software cost factors and apply the various software cost estimation techniques.	Up to K3
CO3	Develop the software requirements definition and able to design software using several notations.	Up to K3
CO4	Identify the implementation issues and realize the verification and validation techniques.	Up to K3
CO5	Analyze the software maintenance.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT - I: **[12 Hrs]**

Introduction: Some Definitions – Some Size Factors – Quality and Productivity Factors – **Planning a Software Project:** Introduction - Defining the Problem – Developing a Solution Strategy – Planning the Development Process – The Phased Life-Cycle Model – The Prototype Life-Cycle Model – Planning an Organizational Structure – Project Structure – Programming Team Structure.

UNIT - II: **[12 Hrs]**

Software Cost Estimation: Introduction – Software Cost Factors – Software Cost Estimation Techniques – Expert Judgment – Delphi Cost Estimation – Work Breakdown Structures – Algorithmic Cost Models – Staffing-Level Estimation – Estimating Software Maintenance Costs.

UNIT - III: **[12 Hrs]**

Software Requirements Definition: Introduction – The Software Requirements Specification – Formal Specification Techniques – Relational Notations – State-Oriented Notations – Structured Analysis and Design Technique – Structured System Analysis – **Software Design:** Introduction – Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations.

UNIT - IV: **[12 Hrs]**

Implementation Issues: Introduction – Coding Style – Documentation Guidelines – **Verification and Validation Techniques:** Introduction – Quality Assurance – Walkthroughs and Inspections – Unit Testing – Debugging – System Testing

UNIT - V: **[12 Hrs]**

Software Maintenance: Introduction – Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management – Source-Code Metrics.

TEXT BOOK:
01.Richard E. Fairly, "Software Engineering Concepts", Tata McGraw – Hill Book Company, 1997.

UNIT	CHAPTERS
I	1.1–1.3, 2.1, 2.2, 2.3.1, 2.3.4, 2.4.1, 2.4.2
II	3.1 – 3.4
III	4.1, 4.2.1, 4.2.2, 4.3.3, 4.3.4, 5.1-5.3
IV	6.2, 6.4, 8.1, 8.2, 8.5, 8.6
V	9.1-9.4

REFERENCES:
01.Roger S. Pressman, "Software Engineering: A Practitioner's Approach", 6th Edition, Tata McGraw Hill Publications, New Delhi, 2010.
02.Waman S.Thawadekar, Software Engineering – Principles and Practical, Mc Graw Hill Publications,2004.
03.Rajib Mall, Fundamentals of Software Engineering, PHI Learning Private Limited, Delhi, 2018.

WEB RESOURCES:
01.https://edutechlearners.com/software-engineering-roger-s-pressman-pdf/amp/
02.https://mrcet.com/downloads/digital_notes/IT/Software%20Engineering.pdf

PEDAGOGY: Chalk and Talk, Power point presentation, and Group discussion.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	Some Definitions	1	Chalk & Talk	Black Board
1.2	Some Size Factors	2	Chalk & Talk	Black Board
1.3	Quality and Productivity Factors	2	Chalk & Talk	Black Board
1.4	Planning a Software Project, Introduction	1	Chalk & Talk	Black Board
1.5	Defining the Problem	1	Chalk & Talk	Black Board

1.6	Developing a Solution Strategy	1	Chalk & Talk	Black Board
1.7	Planning the Development Process	2	Chalk & Talk	Black Board
1.8	Planning an Organizational Structure	2	Chalk & Talk	Black Board
UNIT – II [12 Hrs]				
2.1	Software Cost Estimation, Introduction	1	Chalk & Talk	Black Board
2.2	Software Cost Factors	2	Chalk & Talk	Black Board
2.3	Software Cost Estimation Techniques	1	Chalk & Talk	Black Board
2.4	Expert Judgment	1	Chalk & Talk	Black Board
2.5	Delphi Cost Estimation	2	Chalk & Talk	Black Board
2.6	Work Breakdown Structures	1	Chalk & Talk	Black Board
2.7	Algorithmic Cost Models	2	Chalk & Talk	Black Board
2.8	Staffing-Level Estimation	1	Chalk & Talk	Black Board
2.9	Estimating Software Maintenance Costs	1	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Software Requirements Definition, Introduction	1	Chalk & Talk	Black Board
3.2	The Software Requirements Specification	1	PPT presentation	Projector
3.3	Formal Specification Techniques	3	PPT presentation	Projector
3.4	Structured Analysis and Design Technique	1	PPT presentation	Projector
3.5	Structured System Analysis	1	PPT presentation	Projector
3.6	Software Design, Introduction	1	PPT presentation	Projector
3.7	Fundamental Design Concepts	1	PPT presentation	Projector
3.8	Modules and Modularization Criteria	1	PPT presentation	Projector
3.9	Design Notations	2	PPT presentation	Projector
UNIT – IV [12 Hrs]				
4.1	Implementation Issues, Introduction	1	PPT presentation	Projector
4.2	Coding Style	2	PPT presentation	Projector
4.3	Documentation Guidelines	1	PPT presentation	Projector
4.4	Verification and Validation Techniques, Introduction	1	PPT presentation	Projector
4.5	Quality Assurance	1	PPT presentation	Projector
4.6	Walkthroughs and Inspections	1	PPT presentation	Projector
4.7	Unit Testing	2	PPT presentation	Projector
4.8	Debugging	1	PPT presentation	Projector
4.9	System Testing	2	PPT presentation	Projector

	UNIT – V [12 Hrs]			
5.1	Software Maintenance, Introduction	1	PPT presentation	Projector
5.2	Enhancing Maintainability during Development	3	PPT presentation	Projector
5.3	Managerial Aspects of Software Maintenance	3	PPT presentation	Projector
5.4	Configuration Management	3	PPT presentation	Projector
5.5	Source-Code Metrics	2	PPT presentation	Projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	3	3	3	2	1
CO3	3	2	3	2	1
CO4	3	3	2	3	2
CO5	2	2	3	1	2

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Ms. SEEMA B

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Core Subject   **COMPUTER NETWORKS**   Code: 212603602

SEMESTER VI   **4 Hrs/Week**
          Credits 3

PREAMBLE:
- ✍ *To understand the basic Concepts of Computer Networks.*
- ✍ *To study the Functions of different layers of OSI Model, IEEE Standards and different Protocols employed in Computer Networking.*
- ✍ *To introduce various Network Components and their Functions.*
- ✍ *To study about Network Security Concepts.*

COURSE OUTCOMES (COs)
On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Understand the Data Communications, Networks, the Internet, Protocols and Standards.	Up to K3
CO2	Examine the Network model, Data Link Layer	Up to K3
CO3	Develop the Multiple Access Control and IEEE Standards	Up to K3
CO4	Identify the Network Layer, Internet Protocol and Routing Protocols	Up to K3
CO5	Analyze the Transport Layer, User Datagram Protocol and TCP	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT - I: **[12 Hrs]**

Physical Layer: **Introduction:** Data Communications – Networks – The Internet - Protocols and Standards. **Transmission Media:** Guided Media – Twisted Pair, Coaxial Cable, Fiber Optic Cable - Unguided Media – Radio waves, Microwaves, Infrared rays - Satellite Networks.

UNIT - II: **[12 Hrs]**

Network Models: The OSI Model and Functions of Layers – TCP/IP Protocol Suite. **Addressing:** Physical Address, Logical Address, Port Address – Specific Addresses.

Data Link Layer: Data Link Layer Functions - Introduction - **Error Detection:** VRC – LRC - CRC – Checksum – **Error Correction:** Hamming Code – **Flow Control and Error Control:** Stop-and-Wait ARQ – Go Back n ARQ – Selective Repeat ARQ.

UNIT - III: **[12 Hrs]**

Multiple Access Control: Random Access - Pure ALOHA, Slotted ALOHA, 1-Persistent CSMA, Non-Persistent CSMA, p-Persistent CSMA - CSMA/CD, Controlled Access - Token Passing – **IEEE Standards:** IEEE 802.3 Standard Ethernet LAN – IEEE 802.5 Token Ring LAN.

UNIT - IV: **[12 Hrs]**

Network Layer: Repeaters – Hubs - Bridges – Routers – Gateways - Firewalls – Tunneling– **Internet Protocol:** IPv4 Addresses - IPv4 protocol – Delivery – Forwarding – Routing - **Routing Protocols:** Distance vector routing – Link State Routing – Path Vector Routing.

UNIT - V: **[12 Hrs]**

Transport Layer: **Duties of Transport Layer:** Process-to-Process Delivery - Connection Establishment and Termination – **User Datagram Protocol:** Services - User Datagram Format – Uses of UPP - **TCP:** Services – Features – TCP Segment Format.

TEXT BOOK:

01. Behrouz A. Forouzan, "Data Communications and Networking", 4th Edition, Tata McGraw-Hill, New Delhi, 2004.

UNIT	CHAPTERS
I	1.1–1.4, 7.1, 7.2
II	2.2-2.5, 10.1-10.5, 11.2-11.5
III	12.1-12.2, 13.1-13.2
IV	15.1, 19.1
V	23.1-23.3

REFERENCES:

01. Andrew Tanenbaum S., Computer Networks, 4th Edition, Prentice Hall of India, New Delhi, 2006.
02. Larry peterson L., and peter Davie S., "Computer Networks", Harcourt Asia Pvt. Ltd., Second edition.
03. James kurose F., and keith Ross W., "Computer Networking": A Top-down Approach Featuring the Internet", Pearson Education, New Delhi, 2003.

WEB RESOURCES:

01. http://eti2506.elimu.net/Introduction/Books/Data%20Communications%20and%20Networking%20By%20Behrouz%20A.Forouzan.pdf

PEDAGOGY: Chalk and Talk, Power point presentation, and Group discussion.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	Introduction, Data Communications	1	Chalk & Talk	Black Board
1.2	Networks	2	Chalk & Talk	Black Board
1.3	The Internet	2	Chalk & Talk	Black Board
1.4	Protocols and Standards	1	Chalk & Talk	Black Board
1.5	Transmission Media, Guided Media	2	Chalk & Talk	Black Board
1.6	Twisted Pair, Coaxial Cable, Fiber Optic Cable	2	Chalk & Talk	Black Board
1.7	Unguided Media,Radio waves, Microwaves, Infrared rays, Satellite Networks.	2	Chalk & Talk	Black Board
UNIT – II [12 Hrs]				
2.1	Network Models, The OSI Model	1	Chalk & Talk	Black Board
2.2	TCP/IP Protocol Suite	1	Chalk & Talk	Black Board
2.3	Functions of Layers, TCP/IP Protocol Suite	1	Chalk & Talk	Black Board
2.4	Addressing, Physical Address	1	Chalk & Talk	Black Board
2.5	Logical Address, Port Address	2	Chalk & Talk	Black Board
2.6	Specific Addresses	1	Chalk & Talk	Black Board
2.7	Specific Addresses	1	Chalk & Talk	Black Board
2.8	Data Link Layer, Data Link Layer, Functions	1	Chalk & Talk	Black Board
2.9	LRC, CRC, Checksum, Error Correction, Hamming Code	1	Chalk & Talk	Black Board
2.10	Error Detection- VRC,LRC, CRC and Checksum	1	Chalk & Talk	Black Board
2.11	Flow Control and Error Control - Stop-and-Wait ARQ, Go Back n ARQ, and Selective Repeat ARQ.	1	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Multiple Access Control- Random Access	2	Chalk & Talk	Black Board
3.2	Pure ALOHA, Slotted ALOHA, 1,CSMA/CD,Controlled Access, Token Passing	4	PPT presentation	Projector
3.3	IEEE Standards, IEEE 802.3 Standard Ethernet LAN	3	PPT presentation	Projector
3.4	IEEE 802.5 Token Ring LAN	3	PPT presentation	Projector
UNIT – IV [12 Hrs]				
4.1	Network Layer: Repeaters, Hubs,Bridges,Routers,,Gateways, Firewalls and Tunneling	3	PPT presentation	Projector
4.2	Internet Protocol- IPv4 Addresses, IPv4 protocol,Delivery, Forwarding,Routing, Routing Protocols,Distance vector routing, Link State Routing,,PathVector Routing, Tunneling	3	PPT presentation	Projector
4.3	Internet Protocol-IPv4 Addresses,IPv4,protocol, Delivery,Forwarding, Routing	3	PPT presentation	Projector

4.4	Routing Protocols- Distance vector routing, Link State Routing,Path Vector Routing.	3	PPT presentation	Projector
UNIT – V [12 Hrs]				
5.1	Transport Layer: Duties of Transport Layer: Process-to-Process, Uses of UPP	3	PPT presentation	Projector
5.2	Delivery Connection Establishment and Termination	3	PPT presentation	Projector
5.3	User Datagram Protocol- Services, User Datagram Format	3	PPT presentation	Projector
5.4	Services, Features, TCP Segment Format	3	PPT presentation	Projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	3	3	3	2	1
CO3	3	2	3	2	1
CO4	3	3	2	3	2
CO5	2	2	3	1	2

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr. R. KARTHIKEYAN

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Core Subject	**DATA MINING WITH R PROGRAMMING**	**Code: 212603603**
	SEMESTER VI	**4 Hrs/Week**
		3 Credits

PREAMBLE:
  - ✍ *To enable the students to learn data mining concepts and techniques used in it.*
  - ✍ *To understand how the data analyzed using R programming.*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Understand KDD process for finding interesting pattern from warehouse.	Up to K3
CO2	To extract knowledge from data repository for data analysis, frequent pattern, classification and prediction	Up to K3
CO3	Develop the use of data structure and loop functions.	Up to K3
CO4	Analyse data and generate reports based on the data	Up to K3
CO5	Apply various concepts Data exploration and visualization	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

What is Data mining? -Kinds of data-Data mining functionalities -Data Preprocessing-Data cleaning-Data integration and Transformation-Data Reduction

UNIT – II: **[12 Hrs]**

Classification and Prediction- Classification by Decision tree induction- Bayesian Classification- Rule based Classification- Classification by Propagation- Prediction.

UNIT – III: **[12 Hrs]**

Introduction to R programming: What is R? -Working in the Console - Arithmetic Operators - Logical Operations - Using Functions.

Data structures, variables, and data types: Creating Variables - Numeric, Character and Logical Data - Data Frames - Factors -Special Values. Iteration and Conditional Statements: while loops- for loops- If / else Boolean logical operators

UNIT – IV: **[12 Hrs]**

R packages and scripts: Installing and loading packages - Setting up your working directory - Downloading and importing data - Working with missing data- Extracting a subset of a data frame - Writing R scripts - Adding comments and documentation - Creating reports.

Working with messy data: Messy Data - Renaming Columns (Variable Names) -Attaching / Detaching- Tabulating Data: Constructing Simple Frequency Tables -Ordering Factor Variables.

UNIT – V: **[12 Hrs]**

Data exploration and visualization: Using the ggplot2 package to visualize data - Applying themes from ggthemes to refine and customize charts and graphs -Building data graphics for dynamic reporting.

Data querying: SQL and R: Writing SQL statements in R - Using the Select, From, Where, Is, Like, Order By, Limit, Max, Min SQL functions Writing functions Reporting: Creating functions - Calling functions

TEXT BOOK:
01. "Data Mining Concepts and Techniques": Jiawei Han and Micheline Kamber-Second Edition , Morgan Kaufmanns Publishers, USA, 2008.

Units	Chapters
I	1.2,1.3,1.4, 2.1,2.3,2.4,2.5
II	6.1,6.3,6.4,6.5,6.6,6.11

02. Wickham, H. & Grolemund, G. (2018) for Data Science. O'Reilly: New York. Available for free at http://r4ds.had.co.nz

Units	Chapters
III	1,2,3,4
IV	5,6
V	7,8,9

WEB RESOURCES:
01. R Project: http://www.r-project.org/
02. RStudio (additional libraries required): http://www.rstudio.com
03. Quick-R http://www.statmethods.net/
04. Google's R Style Guide: http://google-styleguide.googlecode.com/svn/trunk/Rguide.xml

PEDAGOGY: Chalk and Talk, Power point presentation, and Group discussion.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	What is Data mining? -Kinds of data	3	Chalk & Talk	Black Board
1.2	Data mining functionalities -	3	Chalk & Talk	Black Board
1.3	Data Preprocessing-Data cleaning-Data integration	3	PPT presentation	Projector
1.4	Transformation-Data Reduction	3	PPT presentation	Projector
UNIT – II [12 Hrs]				
2.1	Classification and Prediction	3	Chalk & Talk	Black Board
2.2	Classification by Decision tree induction	2	Chalk & Talk	Black Board
2.3	Bayesian Classification	3	Chalk & Talk	Black Board
2.4	Rule based Classification	2	Chalk & Talk	Black Board
2.5	Classification by Propagation-Prediction.	2	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Introduction to R programming-What is R? -Working in the Console	2	Chalk & Talk	Black Board
3.2	Arithmetic Operators - Logical Operations - Using Functions.	2	PPT presentation	Projector
3.3	Data structures, variables, and data types: Creating Variables - Numeric, Character and Logical *Data*	3	PPT presentation	Projector
3.4	Data Frames - Factors -Special Values.	2	PPT presentation	Projector
3.5	Iteration and Conditional Statements: while loops- for loops-If / else Boolean logical operators	3	PPT presentation	Projector
UNIT – IV [12 Hrs]				
4.1	R packages and scripts: Installing and loading packages -Setting up your working directory	4	PPT presentation	Projector
4.2	Coding Style- Downloading and importing data - Working with missing data- Extracting a subset of a data frame - Writing R scripts - Adding comments and documentation - Creating reports.	4	PPT presentation	Projector
4.3	Working with messy data: Messy Data - Renaming Columns (Variable Names) -Attaching / Detaching- Tabulating Data: Constructing Simple Frequency Tables -Ordering Factor Variables.	4	PPT presentation	Projector
UNIT – V [12 Hrs]				
5.1	Data exploration and visualization: Using the ggplot2 package to visualize data	3	PPT presentation	Projector

5.2	Applying themes from ggthemes to refine and customize charts and graphs -Building data graphics for dynamic reporting.	3	PPT presentation	Projector
5.3	Data querying: SQL and R: Writing SQL statements in R - Using the Select, From, Where, Is, Like, Order By, Limit, Max, Min SQL functions	3	PPT presentation	Projector
5.4	Writing functions Reporting: Creating functions - Calling functions	3	PPT presentation	Projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	3	1
CO3	3	3	3	2	2
CO4	3	3	2	3	1
CO5	3	3	3	2	3

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr.K.Vetrivel

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Core Subject   **DATA MINING WITH R PROGRAMMING LAB**
                                          SEMESTER VI   **Code: 212603604**
                                                                                          4 Hrs/Week
                                                                                          3 Credits

1. Program using Mathematical functions.

2. Program for Reading data from CSV files

3. Program for Inspection of data.

4. Program for reading data from Excel files.

5. Program for Merging datasets.

6. Program for Working with Graphics(Scatterplots, Histogram, Barplots)

7. Program for Exporting Graphics.

8. Program for Matrix Operations.

9. Program using Functions.

REFERENCE BOOK:

01. "Data Mining Concepts and Techniques": Jiawei Han and Micheline Kamber-Second Edition , Morgan Kaufmanns Publishers, USA, 2008.

02. Wickham, H. & Grolemund, G. (2018) for Data Science. O'Reilly: New York. Available for free at http://r4ds.had.co.nz

COURSE DESIGNER: Dr.K.Vetrivel

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Elective - II   **ADVANCED COMPUTING TECHNOLOGIES**   Code: 212603605
                        SEMESTER VI   **4 Hrs/Week**
                                                  Credits 3

PREAMBLE:
- ✍ *To enable the students to learn Cloud computing, IOT and Artificial learning concepts.*
- ✍ *To enable the students to Learn the concept of Artificial Intelligence.*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Learn the knowledge about basic concepts about Cloud computing	Up to K3
CO2	Understand about Cloud infrastructure models	Up to K3
CO3	Understand the concept Introduction to Internet of Things	Up to K3
CO4	Analyze the concept of Domain specific IoTs	Up to K3
CO5	Learn the concept of Artificial Intelligence	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

The Cloud-Software-Hardware-The advantages of cloud infrastructure-Hardware virtualization-Cloud storage-Cloud application architectures- Grid computing-Transactional computing-The value of cloud computing-options for an IT infrastructure

UNIT – II: **[12 Hrs]**

Cloud infrastructure models (SaaS, IaaS, PaaS, Private cloud)-Cloud security: Data security-Network security-Host security.

UNIT – III: **[12 Hrs]**

Introduction to Internet of Things-Definition & characteristics of IoT, Physical design of IoT-Logical design of IoT-IoTenabling Technologies

UNIT – IV: **[12 Hrs]**

Domain specific IoTs :Introduction-Home Automation-Cities-Envirionment-Energy-Retail-Logistics-Agriculture-Industry-Health and life style

UNIT – V: **[12 Hrs]**

Machine Learning

Life Without Machine Learning - Machine Learning Basics - Use of Machine Learning in Daily Life - What is Machine Learning? - How Machine Learning Works - Types of Machine Learning - Comparison Between Supervised and Unsupervised Learning - How do you Choose the Right Machine Learning Solution to Use? - Machine Learning Basics Algorithms - 4 Most Common Machine Learning Algorithms.

TEXT BOOKS:

01. "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud": **Reese, G**-First Edition, O'Reilly Media, Inc., 2009.
02. "Internet of Things: A Hands-on Approach"; **Arshdeep Bahga & Vijay Madiisetti**- ISBN 978-0996025515., 2014.

03. Introduction to Machine Learning: A Beginner's guide, Nikita Duggal.

Units	Chapters
I	Chapter 1 (Text Book 1)
II	Chapter 1,5(Text Book1)
III	Chapter 1(Text Book 2)
IV	Chapter 2(Text Book 2)
V	(Text Book 3)

REFERENCES:
01. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759
02. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draft cloud computing synopsis and recommendation, May 2011.

WEB RESOURCES:
01.https://www.tutorialspoint.com/ Cloud computing
02.https://www.javatpoint.com/ iot/tutorial
03.https://www.geeksforgeeks.org/ iot /
04.https://www.simplilearn.com/tutorials/machine-learning-tutorial/introduction-to-machine-learning

PEDAGOGY: Chalk & Talk, PPT Presentation, Group Discussion, Tutorials.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	The Cloud	1	Chalk & Talk	Black Board
1.2	Software	1	Chalk & Talk	Black Board
1.3	Hardware	1	Chalk & Talk	Black Board
1.4	The advantages of cloud infrastructure	1	Chalk & Talk	Black Board
1.5	Hardware virtualization	1	Chalk & Talk	Black Board
1.6	Cloud storage	1	Chalk & Talk	Black Board
1.7	Cloud application architectures	2	PPT presentation	projector
1.8	Grid computing	1	PPT presentation	projector
1.9	Transactional computing	1	PPT presentation	projector
1.10	The value of cloud computing	1	PPT presentation	projector
1.11	options for an IT infrastructure	1	PPT presentation	projector
UNIT – II [12 Hrs]				
2.1	Cloud infrastructure models	1	Chalk & Talk	Black Board
2.2	SaaS	1	PPT presentation	projector
2.3	IaaS	1	Chalk & Talk	Black Board
2.4	PaaS	1	PPT presentation	projector
2.5	Private cloud	1		
2.1	Cloud security	1	PPT presentation	projector
2.2	Data security	2	Chalk & Talk	Black Board
2.3	Network security	2	Chalk & Talk	Black Board
2.4	Host security	2	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Introduction to Internet of Things	2	Chalk & Talk	Black Board

3.2	Definition of IoT	2	Chalk & Talk	Black Board
3.3	characteristics of IoT	2	PPT presentation	projector
3.4	Physical design of IoT	2	PPT presentation	projector
3.5	Logical design of IoT	2	PPT presentation	projector
3.6	IoT enabling Technologies	2	PPT presentation	projector
UNIT – IV [12 Hrs]				
4.1	Domain specific IoTs	1	Chalk & Talk	Black Board
4.2	Introduction	1	Chalk & Talk	Black Board
4.3	Home Automation	1	PPT presentation	projector
4.4	Cities-Environment	1	PPT presentation	projector
4.5	Energy	1	PPT presentation	projector
4.6	Retail	1	PPT presentation	projector
4.7	Logistics	1	PPT presentation	projector
4.8	Agriculture	1	PPT presentation	projector
4.9	Industry	2	PPT presentation	projector
4.10	Health and life style	2	PPT presentation	projector
UNIT – V [12 Hrs]				
5.1	Life Without Machine Learning	1	Chalk & Talk	Black Board
5.2	Machine Learning Basics - Use of Machine Learning in Daily Life	1	PPT presentation	projector
5.3	What is Machine Learning? - How Machine Learning Works	1	PPT presentation	projector
5.4	Types of Machine Learning	1	PPT presentation	projector
5.5	Comparison Between Supervised and Unsupervised Learning	1	PPT presentation	projector
5.6	How do you Choose the Right Machine Learning Solution to Use?	2	PPT presentation	projector
5.7	Machine Learning Basics Algorithms	2	PPT presentation	projector
5.8	4 Most Common Machine Learning Algorithms.	3	PPT presentation	projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	2	2
CO3	3	3	3	2	2
CO4	3	3	2	3	2
CO5	3	3	2	2	3

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Ms. A.PASUMPON

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Elective II   **COMPUTER SECURITY**   Code: 212603606
SEMESTER VI   **4 Hrs/week**
Credits 3

PREAMBLE:

- ✍ *To understand the Computer criminals and encryption algorithm*
- ✍ *To study the network concepts and gain knowledge about firewalls*
- ✍ *To learn the concepts security planning and give the Economic Impact of Cyber security*

COURSE OUTCOMES (COs)

On Successful completion of the course, the student will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Understand the basics of threats and algorithms for encryption	Up to K3
CO2	Examine the Security, protection and Biometrics	Up to K3
CO3	Identify the Security, Threats in networks, and study the Firewalls, Intrusion detection system.	Up to K3
CO4	Analyze the cyber security and the economic impacts of cyber security	Up to K3
CO5	Evaluate the ethics and determine about the laws and ethics.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

Introduction: Is there a security problem in computing: What does "secure" mean-Attack: Meaning of Computer Security-Computer criminals - Method of defense – Cryptography: terminology and background – substitution ciphers – Transpositions [Permutations] – Making "good" encryption algorithms – The Data Encryption Standard – The AES encryption Algorithm – Public key encryption.

UNIT – II: **[12 Hrs]**

Program Security: secure programs – Non malicious program errors - viruses and other malicious code – Targeted Malicious code : Trojans – Salami Attack – Controls Against Program threats - Protection General – Purpose Operating System : Protected Object and methods of protection – Memory and Address Protection – Control of Access to general objects – File protection Mechanisms – User Authentication.

UNIT – III: **[12 Hrs]**

Security in Networks: Network concepts – Threats in networks – network security Controls – Firewalls – intrusion detection system – secure e-mail.

UNIT – IV: **[12 Hrs]**

Administering security: Security planning - Risk Analysis: The nature of risk-steps of risk Analysis – Steps in Risk Analysis- Arguments for and against Risk Analysis – Organizational Security Policies – Physical security – The Economics of Cyber security : Making a Business case : Determining Economic value – Quantifying security : The Economic impacts of Cyber Security – Modeling Cyber Security.

UNIT – V: **[12 Hrs]**

Legal and Ethical Issues in Computer security : Protecting Programs and data –Information and the law - Rights of employees and employers – redress of software failures – computer crime – ethical issues in computer security.

TEXT BOOK:

01.Charles P.pfleeger, Shari Lawrence Pfleeger " Security in Computing" Fouth edition ,Pearson – 2006.

Unit	Chapters
I	1(Pages 1-28) 2(36-92)
II	3(Pages 119-146,163-168,184-204) 4(211-257)
III	7(pages 401-536)
IV	8(Pages 552-610) 9(615-642)
V	11(Pages 691-742)

REFERENCES:

01. Willam Stallings, Cryptography and Network Security Principles and Practices, 4 th Edition, Pearson Education.
02. Jon Erickson, "Hacking: The Art Of Exploitation", **William Pollock publications,** 2008.

WEB RESOURCES:

01. https://www.computer-pdf.com/tutorials-cyber-security
02.https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_IS_LECTURE_NOTES_0.pdf
03.http://www.cs.unibo.it/babaoglu/courses/security/resources/documents/Computer_Security_Principles_and_Practice_(3rd_Edition).pdf

PEDAGOGY: Chalk and Talk, Power point presentation, and Group discussion.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
	UNIT – I [12 Hrs]			
1.1	Introduction	1	Chalk & Talk	Black Board
1.2	Is there a security problem in computing.	1	Chalk & Talk	Black Board
1.3	Attack: Meaning of Computer Security	1	Chalk & Talk	Black Board
1.4	Computer criminals	1	Chalk & Talk	Black Board
1.5	Method of defense	1	Chalk & Talk	Black Board
1.6	Cryptography: terminology and background	1	Chalk & Talk	Black Board
1.7	substitution ciphers	1	Chalk & Talk	Black Board
1.8	Transpositions [Permutations]	1	Chalk & Talk	Black Board
1.9	Making "good" encryption algorithms	1	Chalk & Talk	Black Board
1.10	The Data Encryption Standard	1	Chalk & Talk	Black Board
1.11	The AES encryption Algorithm	1	Chalk & Talk	Black Board
1.12	Public key encryption	1	Chalk & Talk	Black Board
	UNIT – II [12 Hrs]			
2.1	Program Security: secure programs	1	Chalk & Talk	Black Board

2.2	Non malicious program errors	1	Chalk & Talk	Black Board
2.3	viruses and other malicious code	1	Chalk & Talk	Black Board
2.4	Targeted Malicious code : Trojans	1	Chalk & Talk	Black Board
2.5	Salami Attack , Controls Against Program threats	1	Chalk & Talk	Black Board
2.6	Protection General	1	Chalk & Talk	Black Board
2.7	Purpose Operating System	1	Chalk & Talk	Black Board
2.8	Protected Object and methods of protection	1	Chalk & Talk	Black Board
2.9	Memory and Address Protection	1	Chalk & Talk	Black Board
2.10	Control of Access to general objects	1	Chalk & Talk	Black Board
2.11	File protection Mechanisms	1	Chalk & Talk	Black Board
2.12	User Authentication.	1	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Security in Networks: Network concepts	2	Chalk & Talk	Black Board
3.2	Threats in networks	2	Chalk & Talk	Black Board
3.3	network security Controls	2	Chalk & Talk	Black Board
3.4	Firewalls	2	Chalk & Talk	Black Board
3.5	intrusion detection system	2	Chalk & Talk	Black Board
3.6	secure e-mail	2	Chalk & Talk	Black Board
UNIT – IV [12 Hrs]				
4.1	Administering security: Security planning	1	PPT presentation	Projector
4.2	Risk Analysis	1	PPT presentation	Projector
4.3	The nature of risk-steps of risk Analysis	1	PPT presentation	Projector
4.4	Steps in Risk Analysis	1	PPT presentation	Projector
4.5	Arguments for and against Risk Analysis	1	PPT presentation	Projector
4.6	Organizational Security Policies	1	PPT presentation	Projector
4.7	Physical security	1	PPT presentation	Projector
4.8	The Economics of Cyber security	1	PPT presentation	Projector
4.9	Making a Business case	1	PPT presentation	Projector
4.10	Determining Economic value	1	PPT presentation	Projector
4.11	Quantifying security : The Economic impacts of Cyber Security	1	PPT presentation	Projector
4.12	Modeling Cyber Security.	1	PPT presentation	Projector
UNIT – V [12 Hrs]				
5.1	Legal and Ethical Issues in Computer security :	1	PPT presentation	Projector
5.2	Protecting Programs and data	2	PPT presentation	Projector
5.3	Information and the law	2	PPT presentation	Projector
5.4	Rights of employees and employers	1	PPT presentation	Projector
5.5	accessing protected system , cryptography and the law	2	PPT presentation	Projector

5.6	redress of software failures	2	PPT presentation	Projector
5.7	computer crime	1	PPT presentation	Projector
5.8	ethical issues in computer security	1	PPT presentation	Projector

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	3	3	3	2	2
CO3	3	2	3	2	1
CO4	3	3	2	3	2
CO5	2	2	3	1	2

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Ms. RAJESWARI M

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Elective-III	**PROJECT**	Code: 212603607
	SEMESTER VI	**6 Hrs/Week**
		Credits 5

- ➢ Every student must complete a project work in the sixth semester.
- ➢ Every student will be assigned to a staff member who will provide necessary guidance for preparation.
- ➢ Every student shall be asked maintain work diary relating to the project work.
- ➢ Every student must submit the project report at the end of the sixth semester before the last working day.
- ➢ The report will be signed by the staff guide and counter signed by the head of the department of Information Technology.

Internal = 40 Marks   External = 60 Marks

Report	= 30	Report	= 50
Viva	= 10	Viva	= 10
Total	= 40	Total	= 60.

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Part IV	**OPEN SOURCE LAB**	Code: 214403626
Skill Based Elective IV Lab	**SEMESTER VI**	**2 Hrs/Week**
		Credits 2

PREAMBLE:
- ✍ ***To do simple programs in PHP***
- ✍ ***Perform MySQL Queries through PHP***
- ✍ ***Perform advanced PHP techniques such as File upload, sessions, and authentications.***

01. Write a PHP Program to Perform Student Mark sheet using Operators and Decision making Statements.
02. Write a PHP Program to Generate Multiplication Table using Iterations.
03. Write a PHP Program to Implement Arrays.
04. Write a PHP Program to Implement Functions.
05. Write a PHP Program to Perform String Operations.

06. Perform the Following Operations in MySQL.

  (i) Create Database

  (ii) Drop Database

  (iii)Select Database

07. Perform the Following Operations in MySQL.

  (i) Create Tables

  (ii) Drop Tables

  (iii) Insert Query.

08. Perform the Following Operations in MySQL.

  (i) Select Query

  (ii) „Where" Clause

  (iii) Update Query

REFERENCES:

01. Remy Card, Eric Dumas and Frank Mevel, "The Linux Kernel Book", Wiley Publications, 2003
02. Steve Suchring, "MySQL Bible", John Wiley, 2002.
03. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2002.
04. Wesley J. Chun, "Core Phython Programming", Prentice Hall, 2001
05. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
06. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
07. Vikram Vaswani, "MYSQL: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009

WEB RESOURCES:

01. https://www.w3schools.com/php/
02. https://www.tutorialspoint.com/ebook/python_tutorial/index.asp

COURSE DESIGNER: MS. M. RAJESWARI
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