ANNEXURE - 15

COMPUTER APPLICATIONS

VISION:

To develop young minds with a high academic ambition, by synergising spiritual values and technological competence.

MISSION:

To pursue the mission of imparting the fundamentals and applied aspects of computer education so as to make the students acceptable both to industries and higher institutions of learning.

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	Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems
PO2	Ability to demonstrate knowledge of Computer science and its applications in order to enhance basic understanding of various software technologies.
PO3	Learn to design innovative solutions for solving real life business problems and addressing business development issues with a passion for quality competency and holistic approach.
PO4	Ability to adapt new technologies for upgrading their skills and contributing to a

	lifelong learning.
PO5	Ability to become employable in a variety of IT companies and government sector and also seek entrepreneurship opportunities for the development of an individual and society at large.

PROGRAM SPECIFIC OUTCOME (PSO)

PSO 1	To engage in professional development and to pursue post graduate education in the fields of information technology and Computer Applications.
PSO 2	Analyze and synthesis computing systems through quantitative and qualitative techniques.
PSO 3	Competence to use research, experiment, contemporary issues to solve industrial problems.
PSO 4	Expertise to face the challenges of changing trends and career opportunities as per local and global industry needs.
PSO 5	Tackle the real life problems using the internationally accepted latest technologies.

PO - PEO MAPPING

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

3- Strong   2- Medium   1- Low

B.C.A

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 (4)	Core (3)	Core Lab (4)	Core Lab (3)	Allied Maths (4)	-	–	Total (30)	NCC/NSS/PED /RR/LS. (3)	Com.Eng (2)	Comp.Lit (1)	–	–
II Sem.	I Lang (6)	II Lang (6)	Core (4)	Core Lab (5)	Core Lab (2)	Allied Maths (4)	-	SBE (2)	Elec. EVS (1)	Total (30)	NCC/NSS/PED /RR/LS. (3)	Com.Eng (2)	Comp.Lit (1)	–	Multimedia and its applications
III Sem.	I Lang (6)	II Lang (6)	Core (3	Core (4)	Core Lab (3)	Allied Phys (4)	–	SBE (2)	NME (2)	Total (30)	NCC/NSS/PED /RR/LS. (3)	Com.Eng (2)	Comp.Lit (1)	–	E-Commerce
IV Sem.	I Lang (6)	II Lang (6)	Core (3)	Core (4)	Core Lab (3)	Allied Phys (4)	–	SBE (2)	NME (2)	Total (30)	NCC/NSS/PED /RR/LS. (3)	Com.Eng (2)	Comp.Lit (1)	–	Clint server computing
V Sem.	Core (5)	Core (5)	Core Lab (5)	Core Lab (5)	Elec. (4)	Elec.II (4)	–		Elec. W.S. (1)	Total (30)	–	Com.Eng (2)	Comp.Lit (1)	Skill Devt – Career Guidance (3)	Artificial Intelligence
VI Sem.	Core (5)	Core (6)	Core Lab (6)	Elective (4)	Elective Project (4)		–	SBE (2)	Elec. VBE (2)	Total (30)	–	Com.Eng (2)	Comp.Lit (1)	Skill Devt – Career Guidance (3)	—
									Total	180 Hrs					

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.C.A: 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)	Marks Int.	Marks Ext.
SEMESTER - I										
I	Lang. – I	Tamil – I	210103101	6		3		3	25	75
II	Lang. – II	General English – I	211003102	6		3		3	25	75
III	Core	Programming in C	212703101	4		4		3	25	75
	Core	Open Source Technology	212703102	3		2		3	40	60
	Core Lab	C Programming Lab	212703103	4		3		3	40	60
	Core Lab	Multimedia Lab	212703104	3		2		3	25	75
	Al. Mat	Mathematics for Computer Applications	213103123	4		3		3	25	75
IV	Extension activities	NSS / NCC / PED/ Rover and Rangers/ Library Science and Information	-		3			–	–	–
	Additional Courses	Communicative English – I	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
SEMESTER – II										
I	Lang. – I	Tamil – I	210103201	6		3		3	25	75
II	Lang. – II	General English – II	211003202	6		3		3	25	75
III	Core	Object Oriented programming with C++	212703201	4		4		3	25	75
	Core Lab	C++ Programming Lab	212703202	5		3		3	40	60
	Core Lab	Data Analytics Lab using R Tool	212703203	2		2		3	40	60
	Al.Maths	Optimization Techniques	213103223	4		3		3	25	75
IV	SBE - I	Data Structures	214403227	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 Courses	Communicative English – I	218003201		2		1	3	25	75
		Computer Literacy	-		1			–	–	–
	SLC	Multimedia and its applications	218003227				3	3	–	100
SEMESTER – III										
I	Lang. – I	Tamil – III	210103301	6		3		3	25	75
II	Lang. – II	General English – III	211003301	6		3		3	25	75
III	Core	VB.NET Programming	212703301	3		3		3	25	75
	Core	Operating Systems	212703302	4		2		3	25	75
	Core Lab	VB.NET Programming lab	212703303	3		3		3	40	60
	Al. Physics	Digital Principles and Applications	212103323	4		4		3	25	75
IV	SBE – II	Linux Programming Lab	214403327	2		2		3	40	60
	NME – I	Introduction to computers	214603327	2		2		3	25	75
V	Extension activities	NSS / NCC / PED/ Rover	-		3			–	–	–

		and Rangers/ Library Science and Information								
Additional Courses		Communicative English– II	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
SLC		E-Commerce	218003327				3	3	–	100

Part	Course	Subject	Code	Hrs.	6th Hr.	Cr.	Adl. Cr.	Exam (Hrs)	Marks Int.	Marks Ext.
									Int.	**Ext.**
			SEMESTER – IV							
I	Lang. – I	Tamil – IV	210103401	6		3		3	25	75
II	Lang. – II	General English – IV	211003401	6		3		3	25	75
III	Core	RDBMS	212703401	3		3		3	25	75
	Core	Computer Graphics	212703402	4		4		3	25	75
	Core Lab	RDBMS Lab	212703403	3		3		3	40	60
	Al. Physics	Digital Electronics Lab	212103424	4		4		3	40	60
IV	SBE - III	Image Processing Tool Lab	214403427	2		2		3	40	60
	NME - II	Introduction to Internet	214603427	2		2		3	25	75
V	Extension activities	NSS / NCC / PED/Rover and Rangers/Library Science and Information	-		3	1		3	25 *40	75 *60
	Additional Courses	Communicative English -II	218003401		2		1	3	25	75
		Computer Literacy	-		1			–	–	–
	SLC	Client Server Computing	218003427				4	3	–	100
			SEMESTER – V							
III	Core	Java Programming	212703501	5		5		3	25	75
	Core	Data Communications & Computer Networks	212703502	5		5		3	25	75
	Core Lab	Java Programming Lab	212703503	6		5		3	40	60
	Core Lab	Python Programming Lab	212703504	5		4		3	40	60
	Core	Software Engineering	212703505	4		3		3	25	75
	Elective	Elective I	-	4		3		3	25	75
IV	WS	Women Studies		1		1		2	–	100
	Additional Courses	Communicative English – III	-		2			–	–	–
		Computer Literacy	-		1			–	–	–
		Skill Development – Career Guidance	-		3			–	–	–
	SLC	Artificial Intelligence	218003527				4	3	–	100
			SEMESTER – VI							
III	Core	Web Programming	212703601	5		4		3	25	75
	Core	Project *Report;@viva	212703602	6		5		3	40 (30:10)	60 (50:10)
	Core Lab	Web Programming Lab	212703603	6		5		3	40	60
	Core	Data Warehousing and Data Mining	212703604	5		4		3	25	75
	Elective	Elective – II	-	4		4		3	25	75
IV	SBE - IV	PHP with My SQL Lab	214403627	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	218003603		3		2	3	–	100

		Guidance							
		TOTAL		**180**	**36**	**140**	**20**		

Elective I
1.1 Python Programming -212703506
1.2 Computer Security   - 212703507

Elective II
3.1 Mobile Computing - 212703605
3.2 Cloud Computing – 212703606

Core Subject	**JAVA PROGRAMMING**	**Code: 212703501**
	SEMESTER V	**5 Hrs/Week**
		Credits 5

Preamble:

  ✎ **To educate students about java fundamentals, relationship with the internet, object oriented features and advanced topics such as applet, graphics etc.**

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 fundamentals concepts features, data types, operators, decision making branching and looping.	Up to K3
CO2	Apply the knowledge to implement the Classes, Objects and Methods, Arrays and Strings.	Up to K3
CO3	Analyze and able to understand the Inheritance, extending a class and Package.	Up to K3
CO4	Demonstrate to develop the skills of Multithreaded Programming, Managing Errors and Exceptions.	Up to K3
CO5	Make use of Applet Programming and Managing Input / Output Files.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[15 Hrs]**

Java history – Java features –Java differs from C and C++ - Java environment – Java tokens – Simple java program – Implementing a Java Program – Java virtual machine – Command line arguments – Constants – Variables – Data Types – Operators – Decision making & Branching – Decision making & Looping.

UNIT – II: **[15 Hrs]**

Classes, Objects and Methods:

Introduction – Defining a class – Fields declaration – Methods declaration – Creating objects – Accessing Class Members – Constructors – Method overloading – Static members – Nesting of methods.

Arrays, Strings:

Introduction – One dimensional array – Creating an array – Two–dimensional array – Strings.

UNIT – III: **[15 Hrs]**

Inheritance: Extending a class:

Overriding methods – Final variables and methods – Final classes – Finalizer Methods-Abstract methods and classes – Visiblity control.

Interfaces :Multiple Inheritance:

Defining interfaces – Extending interfaces – Implementing interfaces-Accessing interface Variables.

Package:

Java API packages – Using system packages – Naming conventions – Creating packages – Accessing a package – Using a package-Adding a class to a package.

UNIT – IV: **[15 Hrs]**

Multithreaded Programming:

Introduction – Creating threads – Extending the Thread class – Life cycle of a thread – Using Thread Methods – Synchronization - Implementing the Runnable interfaces.

Managing Errors and Exceptions:

Introduction – Types of errors – Exception – Syntax of Exception Handling code – Multiple catch statements – Using finally statement – Throwing our own Exceptions.

UNIT – V: **[15 Hrs]**

Applet Programming:

Introduction – Preparing to write applets – Building applet code – Applet life cycle – Creating an Executable applet – Applet tag – Adding applet to HTML file – Running the applet – Passing parameters to applet -

Aligning the display – More about HTML Tags - Displaying Numerical Values - Getting Input from the User.

Managing Input / Output Files:

Introduction – Concept of Streams – Stream classes – Using the file class – Creation of files.

TEXT BOOK:
01. Balagurusamy E., Programming with Java, A Primer 4th Edition, Tata McGraw – Hill, 2007.

Unit-I	Chapter-2,3,4,5,6,7	2.1- 2.3, 2.9, 3 4.1 - 4.4; 5.1 - 5.9; 6, 7
Unit-II	Chapter-8,9	8.1 - 8.10; 9.1 - 9.5
Unit-III	Chapter-8,10,11	8.11 - 8.18 ; 10, 11
Unit-IV	Chapter-12,13	12, 13
Unit-V	Chapter-14,16	14 ; 16.1- 16.3,16.8,16.10

REFERENCES:
1. Deital H.M. and Deital P.J., JAVA How to Program, Pearson Education, New Delhi, 2003.
2. Herbert Schildt, Java 2 the Complete Reference, 5th Edition, Tata McGraw – Hill, 2002.

WEB RESOURCES: (URLs)
01. https://www.javatpoint.com/java-tutorial
02. https://www.w3schools.com/java
03. https://www.geeksforgeeks.org/java-tutorial/
04. https://www.javatpoint.com/java-programs

PEDAGOGY: Chalk and talk , PPT, Discussion , Assignment, Demo, Quiz, Case study

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [15 Hrs]				
1.1	Java history, Java features,	2	Lecture	Power point
1.2	Java differs from C and C++, Java environment.	2	Chalk & Talk	Black Board
1.3	Java tokens, Simple java program	2	Chalk & Talk	Black Board
1.4	Implementing a Java Program. – Java virtual machine	2	Lecture	Power point
1.5	Command line arguments, Constants, Variables	1	Lecture	Power point

1.6	Data Types ,Operators	2	Lecture	Power point
1.7	Decision making & Branching	2	Chalk & Talk	Black Board
1.8	Decision making & Looping	2	Chalk & Talk	Black Board
UNIT – II [15 Hrs]				
2.1	Classes, Objects and Methods :Introduction, Defining a class, Fields declaration	2	Chalk &Talk	Black Board
2.2	Methods declaration – Creating objects – Accessing Class Members	2	Chalk & Talk	Black Board
2.3	Constructors	1	Lecture	Power point
2.4	Method overloading	2	Lecture	Power point
2.5	Static members	1	Chalk & Talk	Black Board
2.6	Nesting of methods.	1	Chalk & Talk	Black Board
2.7	Arrays,Strings:Introduction One dimensional array	2	Lecture	Power point
2.8	Creating an array , Two–dimensional array	2	Chalk & Talk	Black Board
2.9	Strings	2	Lecture	Power point
UNIT – III [15 Hrs]				
3.1	Inheritance:Extending a class: Overriding methods	1	Chalk & Talk	Black Board
3.2	Final variables and methods, Final classes, Finalizer Methods- Abstract methods and classes, Visiblity control.	2	Chalk & Talk	Black Board
3.3	Interfaces :Multiple Inheritance: Defining interfaces – Extending interfaces	2	Lecture	Power point
3.4	Implementing interfaces- Accessing interface Variables.	2	Lecture	Power point
3.5	Package: Java API packages, Using system packages, Naming conventions.	2	Chalk & Talk	Black Board
3.6	Using system packages, Naming conventions.	2	Lecture	Power point
3.7	Creating packages – Accessing a package	2	Chalk & Talk	Black Board
3.8	Using a package-Adding a class to a package	2	Lecture	Power point
UNIT – IV [15 Hrs]				
4.1	Multithreaded Programming: Introduction – Creating threads – Extending the Thread class	2	Chalk & Talk	Black Board
4.2	Life cycle of a thread	2	Chalk & Talk	Black Board
4.3	Using Thread Methods – Synchronization	1	Chalk & Talk	Black Board

4.4	Implementing the Runnable interfaces.	2	Chalk & Talk	Black Board
4.5	Managing Errors and Exceptions: Introduction, Types of errors.	2	Lecture	Power point
4.6	Exception, Syntax of Exception Handling code	2	Chalk & Talk	Black Board
4.7	Multiple catch statements, Using finally statement.	2	Chalk & Talk	Black Board
4.8	Throwing our own Exceptions.	2	Chalk & Talk	Black Board
UNIT – V [15 Hrs]				
5.1	Applet Programming: Introduction, Preparing to write applets	1	Chalk & Talk	Black Board
5.2	Building applet code	2	Chalk & Talk	Black Board
5.3	Applet life cycle – Creating an Executable applet	2	Lecture	Power point
5.4	Applet tag – Adding applet to HTML file – Running the applet ion of files.	2	Lecture	Power point
5.5	Passing parameters to applet - Aligning the display	1	Chalk & Talk	Black Board
5.6	More about HTML Tags - Displaying Numerical Values - Getting Input from the User.	1	Chalk & Talk	Black Board
5.7	Managing Input / Output Files: Introduction – Concept of Streams	2	Lecture	Power point
5.8	Stream classes	2	Lecture	Power point
5.9	Using the file class – Creation of files.	2	Lecture	Power point

MAPPING OF COs WITH POs

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

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr. S. SELVAM
****

Core Subject   **DATA COMMUNICATIONS AND COMPUTER NETWORKS**
                      SEMESTER V   **Code: 212703502**
                                                        5 Hrs/Week
                                                        5 Credits

PREAMBLE:

? *Identify different applications of computer communications networks and understand the current state of the telecommunications industry.*

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 concept and importance of OSI and TCP/IP layered architecture.	Up to K3
CO2	Perform link level analysis including error detection, error control and flow control.	Up to K3
CO3	Understand the functions and operations of internetworking devices such as hubs, bridges, routers and gateways.	Up to K3
CO4	To explore the concept and importance of TCP and UDP.	Up to K3
CO5	Understand the standard Internet applications protocols such as FTP, SMTP, HTTP, DNS, etc.,	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[15 Hrs]**

Data Communication – Networks – Protocols and Standards - Line Configuration – Topology – Transmission Mode - Categories of Networks – Internetworks - Digital Data Transmission - Transmission Media – Twisted Pair - Coaxial Cable – Fiber Optics – Radio waves – Microwaves – Infrared rays – Satellite Communication - The OSI Model – TCP/IP Protocol Suite.

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

Data Link Layer: Error Detection and Correction – Types of Errors – Error Detection: VRC – LRC – CRC – Checksum – Error Correction: Hamming code – Flow Control and Error control: Line Discipline - Stop and Wait ARQ – Go Back-N ARQ – Selective Repeat ARQ - IEEE 802.3 Ethernet LAN - IEEE 802.5 Token Ring LAN – FDDI.

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

Network Layer: Internetworking Issues - Connecting Devices - Repeaters – Hubs - Bridges – Routers – Gateways - Packet Switching – IPV4 Addressing – Subnetting – IPv4 Protocol – Routing Algorithms – Distance Vector Routing – Link State Routing.

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

Transport Layer: Duties of the Transport Layer – Connection - User Datagram Protocol (UDP) - Transmission Control Protocol (TCP) - Categories of Congestion Control – Congestion Control in TCP - Quality of services (QOS).

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

Application Layer: Client-Server Model - DNS – FTP - SMTP – HTTP – World Wide Web.

TEXT BOOK:

01. Behrouz Forouzan A., "Data communication and Networking", Tata McGraw-Hill, New Delhi, 2003, Second Edition.

UNIT	CHAPTERS
I	1.2–1.4, 2, 3, 6.1, 7.1-7.2
II	9, 10.1-10.3, 12.2, 12.5, 12.6
III	14.2, 21.1-21.4, 21.6-21.8, 24.2-24.4
IV	18.4, 22.1-22.2, 24.6
V	25.1, 25.3, 25.5, 25.7, 25.9, 25.10

REFERENCES:

01. Andrew Tanenbaum S., "Computer Networks", PHI, Fourth Edition, New Delhi, 2003.
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.
04. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, New Delhi, 2000.

WEB RESOURCES: (URLs)

01. https://www.tutorialspoint.com/data_communication_computer_network/index.htm
02. https://www.javatpoint.com/computer-network-tutorial
03. https://www.geeksforgeeks.org/computer-network-tutorials/
04. https://www.pdfdrive.com/data-communication-and-computer-network-tutorial-e4137074.html
05. http://generalnote.com/Computer-Network/index.php

PEDOGOGY: Chalk and Talk, Power point presentation, Videos and Animation

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [15 hrs]				
1.1	Data communications and Networks	2	Lecture	PowerPoint
1.2	Line configuration, topology, transmission mode	2	Chalk & Talk	Black Board
1.3	Categories of networks and internetworks	2	Chalk & Talk	Black Board
1.4	Digital data transmission	1	Lecture	PowerPoint
1.5	Transmission media	1	Lecture	PowerPoint
1.6	Guided media	1	Lecture	PowerPoint
1.7	Unguided media	2	Chalk & Talk	PowerPoint
1.8	OSI reference model	2	Lecture	PowerPoint
1.9	TCP/IP protocol suite	2	Chalk & Talk	PowerPoint
UNIT – II [15 hrs]				
2.1	Data link layer – Introduction	1	Chalk &Talk	Black Board
2.2	Types of errors	2	Chalk & Talk	Black Board
2.3	Error detection	2	Lecture	PowerPoint
2.4	Error correction	2	Lecture	PowerPoint
2.5	Line discipline	2	Chalk & Talk	Black Board
2.6	IEEE 802.3 Ethernet LAN	2	Chalk & Talk	Black Board
2.7	IEEE 802.5 Token ring	2	Lecture	PowerPoint
2.8	FDDI	2	Lecture	PowerPoint
UNIT – III [15 hrs]				
3.1	Network layer – Introduction	1	Chalk & Talk	Black Board
3.2	Internetworking issues	2	Chalk & Talk	Black Board
3.3	Connecting devices	2	Lecture	PowerPoint
3.4	Packet switching	2	Lecture	PowerPoint
3.5	Sub netting	1	Chalk & Talk	Black Board
3.6	IPv4 Protocol	1	Chalk & Talk	Black Board
3.7	Routing Algorithms	2	Lecture	PowerPoint
3.8	Distance vector routing	2	Chalk & Talk	PowerPoint
3.9	Link state routing	2	Lecture	PowerPoint
UNIT – IV [15 hrs]				
4.1	Transport layer – Introduction	2	Chalk & Talk	Black Board
4.2	Duties of transport layer	2	Chalk & Talk	Black Board
4.3	Connections	1	Lecture	PowerPoint
4.4	User Datagram Protocol	2	Chalk & Talk	Black Board
4.5	Transmission Control Protocol	2	Chalk & Talk	Black Board
4.6	Categories of congestion control	2	Lecture	PowerPoint

4.7	Congestion control in TCP	2	Lecture	PowerPoint
4.8	Quality of Service	2	Chalk & Talk	Black Board
UNIT – V [15 hrs]				
5.1	Application layer – Introduction	1	Chalk & Talk	Black Board
5.2	Client server model	2	Chalk & Talk	Black Board
5.3	DNS	2	Lecture	PowerPoint
5.4	FTP	2	Lecture	PowerPoint
5.5	SMTP	2	Chalk & Talk	Black Board
5.6	HTTP	2	Chalk & Talk	Black Board
5.7	World Wide Web	2	Lecture	PowerPoint
5.8	Static, Dynamic and Active pages	2	Chalk & Talk	PowerPoint

MAPPING OF COs WITH POs

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

3- Strong   2- Medium   1- Low

COURSE DESIGNER: Dr. G. RAJKUMAR
****

Core Lab	**JAVA PROGRAMMING LAB**	Code: 212703503
	SEMESTER V	**6 Hrs/Week**
		Credits 5

PREAMBLE:
  ✍ ***To gain practical knowledge in solving real world problems using Java collection framework.***

LIST OF EXERCISES:
1. Write a Java program to find the Fibonacci series using recursive and non recursive functions.
2. Write a Java program to multiply two given matrices.
3. Write a java program for Method overloading and Constructor overloading.
4. Write a java program to display the employee pay slip.
5. Write a java program that checks whether a given string is palindrome or not.
6. Write a java program to represent Abstract class with example.

7. Write a java program to implement Interface using extends keyword.
8. Write a java program to create user defined package.
9. Write a java program for creating multiple catch blocks.
10. Write a Java program that implements a multi-thread application that has three threads.
11. Write an applet program that displays a simple message.
12. Write a Java program compute factorial value using Applet.
13. Write a java program for handling Mouse events and Key events.
14. Write a java program to connect to database using JDBC &insert values into table.
15. Write a java program that works as a simple calculator.

REFERENCES:

01. Balagurusamy E., Programming with Java, A Primer 4th Edition, Tata McGraw – Hill, 2007.
02. Herbert Schildt, Java 2 the Complete Reference, 5th Edition, Tata McGraw – Hill, 2002.

WEB RESOURCES:

01. https://www.w3schools.com/java/
02. https://www.javatpoint.com/java-tutorial
03. https://www.tutorialspoint.com/java/index.htm
04. https://www.geeksforgeeks.org/java/
05. https://www.guru99.com/java-tutorial.html
06. https://www.codecademy.com/learn/learn-java

COURSE DESIGNER: Dr. G. RAJKUMAR

****

PYTHON PROGRAMMING LAB

Code: 212703504   **SEMESTER V**   **5 Hrs/Week**

4 Credits

Objectives:-
  - ✍ *To include the python programming knowledge in object oriented features, mathematical 3D objects and histogram.*

1. Write a Python program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.

2. Write a Python program that allows the user to enter any integer base and integer exponent, and displays the value of the base raised to that exponent.

3. Write a Python program that prompts the user for a certain number of cities for the Travelling salesman Problem, and displays the total number of possible routes that can be taken.

4. Write a Python program that prompts the user to enter an upper or lower case letter and displays the corresponding Unicode encoding.

5. Write a Python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria: Grade A: Percentage >=80 Grade B: Percentage>=70 and <80 Grade C: Percentage>=60 and <70 Grade D: Percentage>=40 and <60 Grade E: Percentage<40

6. Write a Python program to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user using user-defined function.

7. Write a Python program find factorial of the given number.

8. Write a Python program to find sum of the following series for n terms: 1 - 2/2! + 3/3! - - - - - n/n!

9. Write a Python program to calculate the sum and product of two compatible matrices.

10. Write a Python program to calculate the transpose of a matrix.

11. Write a Python program to determine how many times a given letter occurs in a provided string using recursion.

12. Write a Python program to calculate Fibonacci series using recursion.

13. Write a Python program to create mathematical 3D objects -
    I. Curve
    II. Sphere
    III. Cone
    IV. Arrow
    V. Ring
    VI. Cylinder.

14. Write a Python program to read n integers and display them as a histogram.

15. Write a Python program to display sine, cosine, polynomial and exponential curves.

REFERENCES:
01. T. Budd, Exploring Python, TMH, 1st Ed, 2011.
02. John V. Guttag, Introduction to computation and programming using Python, Revised and Expanded edition, PHI, 2015.

WEB RESOURCES: (URLs)
01. https://www.javatpoint.com/python-programs
02. https://www.studocu.com/in/document/anna-university/be/python-lab-programs/23990633
03. https://www.geeksforgeeks.org/python-programming-examples/
04. https://python-programs.com/
05. https://codelabs.greycampus.com/python/python-lab

PEDOGOGY: Chalk, Talk, Power point presentation, Videos

COURSE DESIGNER: Dr.S.SELVAM
****

Core Subject	**SOFTWARE ENGINEERING**	Code: 212703505
	SEMESTER V	**4 Hrs/Week**
		3Credits

PREAMBLE:
- ? *To learn software engineering principles like planning, designing, implementing techniques and procedure.*
- ? *To acquire knowledge in software testing strategies.*
- ? *To grasp the importance of verification and validation, and maintenance software products by applying various software engineering 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	Outline basic software engineering methods and practices, and their development process model.	Up to K3
CO2	Depicts various software cost factor and cost estimation techniques with their pros and cons.	Up to K3
CO3	Sketch out the software requirement specification in all aspects including required Languages and processors.	Up to K3
CO4	Make use of various software design techniques and notations	Up to K3
CO5	Learn various types of software testing strategies for verification and validation the software project.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hours]**

Introduction to Software engineering: Some definitions – Some Size Factors – Quality and Productivity factors – Managerial issues.

Planning a software project: Defining the problem – Developing a solution strategy – Planning the development process —Planning an organizational Structure.

UNIT – II: **[12 Hours]**

Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Staffing - Level Estimation – Estimating Software Maintenance Costs.

UNIT – III: **[12 Hours]**

Software Requirements Definition: The Software Requirements Specification-Formal Specification Techniques-Languages and Processors for Requirements Specification.

UNIT – IV: **[12 Hours]**

Software design: Fundamental design concepts – Modules and modularization criteria – Design Notations – Design Techniques: Stepwise refinement, levels of abstraction-Detailed design considerations –Test plans– Milestones, walkthroughs and Inspections – Design guide lines.

UNIT – V: **[12 Hours]**

Verification and Validation Techniques: Quality Assurance –Unit Testing and Debugging – System Testing.

Software Maintenance: Enhancing maintainability during development – Managerial Aspects of Software Maintenance – Configuration Management – Source Code Metrics.

TEXT BOOK:

01.Richard Fairely, Software Engineering Concepts, Tata McGraw – Hill International   Edition, New Delhi, 2014 Reprint.

UNIT	CHAPTER/SECTIONS
I	1 (1.1-1.4), 2 (2.1-2.4)
II	3
III	4
IV	5(5.1,5.2,5.3,5.41,5.4.2,5.7,5.8, 5.9)

V	8(8.1,8.2,8.5, 8.6),9

REFERENCES:

01. Jawadekar, Software Engineering, Tata McGraw – Hill Book Company, 2004.
02. Roger Pressman S., Software Engineering A Practitioners Approach, McGraw – Hill International Editions, 4thEdition, New Delhi, 1997.

WEB RESOURCES:

1. https://www.javatpoint.com/software-engineering-tutorial
2. https://www.tutorialspoint.com/software_engineering
3. https://www.geeksforgeeks.org/software-engineering/

PEDOGOGY: Chalk and talk, LCD Projector, Desktop Computer with JDK.

COURSE CONTENTS & TEACHING/LEARNING SCHEDULE

Module	TOPIC	No. of Lecture	Content Delivery Method	Teaching Aids
Unit – I [12 Hrs]				
1.1	Introduction to Software engineering	1	Chalk & Talk	Black Board
1.2	Some definitions	1	Lecture	PowerPoint
1.3	Some Size Factors	1	Lecture	Black Board
1.4	Quality and Productivity factors	3	Lecture	PowerPoint
1.5	Managerial issues	1	Lecture	PowerPoint
1.6	Planning a software project	1	Lecture	PowerPoint
1.7	Defining the problem	1	Lecture	PowerPoint
1.8	Developing a solution strategy	1	Chalk & Talk	Black Board
1.9	Planning the development process	1	Lecture	PowerPoint
1.10	Planning an organizational Structure	1	Lecture	PowerPoint
Unit – II [12 Hrs]				
2.1	Software Cost Estimation	1	Lecture	PowerPoint
2.2	Software Cost Factors	3	Lecture	PowerPoint
2.3	Software Cost Estimation Techniques	3	Lecture	PowerPoint
2.4	Staffing - Level Estimation	3	Lecture	PowerPoint
2.5	Estimating Software Maintenance Costs	2	Lecture	PowerPoint
Unit – III [12 Hrs]				
3.1	Software Requirements Definition	3	Lecture	PowerPoint
3.2	The Software Requirements Specification	3	Lecture	PowerPoint
3.3	Formal Specification Techniques.	3	Lecture	PowerPoint
3.4	Languages and Processors for Requirements Specification	3	Chalk & Talk	Black Board
Unit – IV [12 Hrs]				

4.1	Software design	1	Chalk & Talk	Black Board
4.2	Fundamental design concepts	1	Lecture	PowerPoint
4.3	Modules and modularization criteria	3	Lecture	PowerPoint
4.4	Design Notations	1	Lecture	PowerPoint
4.5	Design Techniques: Stepwise refinement, levels of abstraction	2	Chalk & Talk	Black Board
4.6	Test plans	1	Lecture	PowerPoint
4.7	Milestones, walkthroughs and Inspections	2	Chalk & Talk	Black Board
4.8	Design guide lines	1	Lecture	PowerPoint
Unit – V [12 Hrs]				
5.1	Verification and Validation Techniques	2	Lecture	PowerPoint
5.2	Quality Assurance	1	Lecture	PowerPoint
5.3	Unit Testing and Debugging	2	Lecture	PowerPoint
5.4	System Testing	1	Chalk & Talk	Black Board
5.5	Software Maintenance	1	Lecture	PowerPoint
5.6	Enhancing maintainability during development	1	Chalk & Talk	Black Board
5.7	Managerial Aspects of Software Maintenance	1	Lecture	PowerPoint
5.8	Configuration Management	2	Chalk & Talk	Black Board
5.9	Source Code Metrics	1	Lecture	PowerPoint

MAPPING OF COs WITH POs

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

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr. S.VIJAYALAKSHMI

****

Elective-I-Major   **1.1   PYTHON PROGRAMMMING**   **Code: 212703506**

SEMESTER V   **4 Hrs/Week**

Credits 3

PREAMBLE:

? *To develop students about Python programs with conditionals and loops. and implement the concept of lists, tuples, dictionaries and input/output with files.*

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 fundamentals concepts features, input from keyboard, data types, - string operations, operators, decision making branching and looping.	Up to K3
CO2	Apply the knowledge to implement Built-in-functions, user defined function and recursive function.	Up to K3
CO3	Analyze and able to understand the strings and lists.	Up to K3
CO4	Demonstrate to develop the skills of tuples and dictionaries.	Up to K3
CO5	Make use of files and built in exceptions and user-defined exceptions.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT - I   **[12 Hrs]**

INTRODUCTION TO PYTHON:

Introduction - python overview - comments - python identifiers - reserved keywords - variables - declaring a variables - initializing a variable - standard data types - numeric - string - list - tuple - dictionary - Boolean - sets - type() function-operators- arithmetic- comparison- assignment- bitwise-logical- membership- string operations - concatenation - repetition - get particular character - slicing - Boolean expressions - control statements - the for loop - while statement - if elif else statement - alternative executions - conditional execution - iteration - while statement - input from keyboard - input() function - raw -input() function .

UNIT - II   **[12 Hrs]**

FUNCTIONS:

Introduction – Built-in-functions – type conversion – type coercion – dir() function – help() function – composition of function – user defined function –parameters and arguments – default arguments – variable – length arguments– function calls – the return statement – python recursive function – the anonymous function – writing python scripts.

UNIT - III   **[12 Hrs]**

STRINGS AND LISTS:

Strings – compound data type – len function – string slices – strings are immutable – string traversal – escape characters – string formatting

operator –string formatting functions - list – values and accessing elements – lists are mutable – traversing a list – deleting elements from list – built in list operators – built list methods.

UNIT - IV   **[12 Hrs]**

TUPLES AND DICTIONARIES:

Tuples – creating tuples – accessing values in tuples – tuples are immutable –tuple assignment – tuples as return values – variable – length argument tuples – basic tuple operators – built in tuples functions – dictionaries – creating a dictionary – accessing values in a dictionary – updating dictionary – deleting elements from dictionary – operations in dictionary -built in dictionary methods.

UNIT - V

[12Hrs]

FILES AND EXCEPTIONS:

Text files – opening a file – closing a file – the file object attributes – writing to a file – reading from a file – renaming a file – deleting a file – files related methods – directories – mkdir() method – chdir() method – getcwd() method – rmdir() method – exceptions – built in exceptions – handling exceptions – exception with arguments – user defined exceptions.

TEXT BOOK:
   01. Introduction to computing and problem solving using python, E.Balagurswamy McGraw education private limited, ,2016.

Unit I	- Chapter 3
Unit II	- Chapter 4
Unit III	- Chapter 5
Unit IV	- Chapter 6
Unit V	- Chapter 7

REFERENCES:
   01. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
   02. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

WEB RESOURCES: (URLs)
   01. https://www.geeksforgeeks.org/python-programming-examples/
   02. https://python-programs.com/
   03. https://codelabs.greycampus.com/python/python-lab

04.http://greenteapress.com/wp/thinkpython/

PEDAGOGY: Chalk and talk , PPT, Discussion , Assignment, Demo, Quiz, Case study

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	Introduction - python overview , comments - python identifiers ,reserved keywords	2	Lecture	Powerpoint
1.2	variables , declaring a variables , initializing a variable , standard data types ,numeric.	1	Chalk & Talk	Black Board
1.3	string , list , tuple ,dictionary , Boolean , sets , type() function.	1	Chalk & Talk	Black Board
1.4	Operators, arithmetic, comparison, assignment, bitwise, logical- membership	2	Lecture	Power point
1.5	string operations - concatenation - repetition - get particular character -	1	Lecture	Power point
1.6	slicing - Boolean expressions, control statements - the for loop - while statement	2	Lecture	Power point
1.7	if elif else statement - alternative executions - conditional execution -	1	Chalk & Talk	Black Board
1.8	iteration - while statement - input from keyboard - input() function - raw_input() function .	2	Chalk & Talk	Black Board
UNIT – II [12 Hrs]				
2.1	Introduction – Built-in-functions	2	Chalk &Talk	Black Board
2.2	type conversion – type coercion – dir() function	2	Chalk & Talk	Black Board
2.3	help() function – composition of function	1	Lecture	Power point
2.4	user defined function – parameters and arguments – default arguments	2	Lecture	Power point
2.5	variable – length arguments– function calls	1	Chalk & Talk	Black Board
2.6	the return statement – python recursive function	2	Chalk & Talk	Black Board
2.7	the anonymous function – writing python scripts.	2	Lecture	Power point
UNIT – III [12 Hrs]				

3.1	Strings – compound data type – len function – string slices	1	Chalk & Talk	Black Board
3.2	strings are immutable – string traversal – escape characters	2	Chalk & Talk	Black Board
3.3	string formatting operator – string formatting functions	2	Lecture	Power point
3.4	list – values and accessing elements – lists are mutable.	2	Lecture	Power point
3.5	traversing a list – deleting elements from list	2	Chalk & Talk	Black Board
3.6	built in list operators	2	Lecture	Power point
3.7	built list methods.	1	Chalk & Talk	Black Board
UNIT – IV [12 Hrs]				
4.1	Tuples – creating tuples – accessing values in tuples	2	Chalk & Talk	Black Board
4.2	tuples are immutable –tuple assignment – tuples as return values	2	Chalk & Talk	Black Board
4.3	variable – length argument tuples – basic tuple operators – built in tuples functions	2	Chalk & Talk	Black Board
4.4	dictionaries – creating a dictionary – accessing values in a dictionary	2	Chalk & Talk	Black Board
4.5	updating dictionary – deleting elements from dictionary –	2	Lecture	Power point
4.6	operations in dictionary -built in dictionary methods.	2	Chalk & Talk	Black Board
UNIT – V [12 Hrs]				
5.1	Text files – opening a file – closing a file – the file object attributes	2	Chalk & Talk	Black Board
5.2	writing to a file – reading from a file – renaming a file – deleting a file –	2	Chalk & Talk	Black Board
5.3	files related methods – directories – mkdir() method – chdir() method – getcwd()method	2	Lecture	Power point
5.4	rmdir() method – exceptions – built in exceptions	2	Lecture	Power point
5.5	handling exceptions – exception with arguments	2	Chalk & Talk	Black Board
5.6	User defined exceptions.	2	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	3	2

CO2	2	3	2	3	3
CO3	3	2	3	2	1
CO4	3	3	2	3	3
CO5	3	3	2	2	3

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr.S. SELVAM
****
****

Elective-I Major 212703507	**1.2 COMPUTER SECURITY**	Code:

SEMESTER V   **4 Hrs/Week**

                                                                                                    Credits 3

Objectives:-
   ? *To gain the knowledge of computing security problems, cryptography, Protection in Operating System, Security in databases and networks and administering security issues.*

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 characteristics and security problems in computing.	Up to K3
CO2	Understand Various Encryption mechanisms for secure transmission of data and management of key required for required for encryption.	Up to K3
CO3	Understand the functions and operations of program security and study various authentication mechanisms.	Up to K3
CO4	To explore the concept of database security and threats in network.	Up to K3
CO5	Understand the various network security techniques and risk analysis.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

Security Problem in Computing:

        Characteristics of computer intrusion –Attacks – Meaning of computer Security - Security Goals- Computer Criminals – Methods of defence.

UNIT – II: **[12 Hrs]**

Cryptography:

Substitution Ciphers - Transpositions: columnar transpositions – Data Encryption standard: Overview of DES- Fundamental Concepts of DES– Public Key Encryption: RSA Encryption.

UNIT – III: **[12 Hrs]**
Program Security

Viruses: Kinds of malicious code – Virus Attach – Document virus – Homes for Virus.

Protection in General Purpose Operating System:

Memory and Address Protection – File Protection mechanisms – User Authentication: Passwords as authenticators – Additional Authentication information – attacks on passwords – password selection criteria – Biometrics.

UNIT – IV: **[12 Hrs]**

Database Security: Introduction to Database – Security Requirements-Inference - Multilevel databases.

Security in Networks:

Threats in Networks: Network vulnerable – categories of Attack – who attacks networks – Reconnaissance – Threats in transit – microwave – impersonation – message confidentially threats – message integrity threats – website vulnerabilities.

UNIT – V: **[12 Hrs]**

Network security Techniques: Firewalls: What is Firewall? – Types of Firewalls – Intrusion Detection Systems: Types of ID's.

Administering Security: Security planning – Risk analysis: Nature of Risk- Steps of a Risk Analysis – Physical security.

TEXT BOOK:
1. Charles P. Pfleeger, Shari Lawrence Pfleeger, Security in Computing, 4th Edition, Person Education, New Delhi, 2009.

Unit-I	Chapter 1	1.1 - 1.5,
Unit-II	Chapter 2	2.2, 2.3,2.5,2.7
Unit-III	Chapter 3,4	3.3, 4.2, 4.4, 4.5
Unit-IV	Chapter 6	6.1,6.2, 6.5,6.6, 7.2
Unit-V	Chapter 7	7.4,7.5, 8.1,8.2, 8.4

REFERENCE:

1. Atul Kahate, Cryptography and Network Security, Tata McGraw – Hill, New Delhi, 2003.
   WEB RESOURCES: (URLs)
   01. https://www.tutorialspoint.com/computer_security/index.htm
   02. https://data-flair.training/blogs/computer-security/
   03. https://training.apnic.net/wp-content/uploads/sites/2/2016/12/TSEC01.pdf
   04. https://www.youtube.com/watch?v=cs3B0zcRJco

PEDAGOGY: Chalk and talk , PPT, Discussion

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	Security problem in computing	2	Lecture	PowerPoint
1.2	Characteristics of computer intrusion	2	Chalk & Talk	Black Board
1.3	Attacks	2	Chalk & Talk	Black Board
1.4	Meaning of computer security	1	Lecture	PowerPoint
1.5	Security goals	1	Lecture	PowerPoint
1.6	Computer criminals	2	Lecture	PowerPoint
1.7	Method of defence	2	Chalk & Talk	PowerPoint
UNIT – II [12 Hrs]				
2.1	Cryptography – Introduction	2	Chalk &Talk	Black Board
2.2	Substitution ciphers	2	Chalk & Talk	Black Board
2.3	Transpositions	2	Lecture	PowerPoint
2.4	Data Encryption standard	2	Lecture	PowerPoint
2.5	Public key encryption	2	Chalk & Talk	Black Board
2.6	RSA Encryption	2	Chalk & Talk	Black Board
UNIT – III [12 Hrs]				
3.1	Program security	1	Chalk & Talk	Black Board
3.2	Viruses	2	Chalk & Talk	Black Board
3.3	Protection in general purpose OS	2	Lecture	PowerPoint
3.4	Memory and address protection	2	Lecture	PowerPoint
3.5	Authentication information	2	Chalk & Talk	Black Board
3.6	Attacks on Passwords	1	Chalk & Talk	Black Board
3.7	Biometrics	2	Lecture	PowerPoint
UNIT – IV [12 Hrs]				
4.1	Database security – Introduction	1	Chalk & Talk	Black Board
4.2	Security requirements	2	Chalk & Talk	Black Board
4.3	Multilevel databases	1	Lecture	PowerPoint
4.4	Threats in networks	2	Chalk & Talk	Black Board
4.5	Categories of attack	2	Chalk & Talk	Black Board
4.6	Reconnaissance	1	Lecture	PowerPoint

4.7	Message integrity and confidentially threats	2	Lecture	PowerPoint
4.8	Website vulnerabilities	1	Chalk & Talk	Black Board
UNIT – V [12 Hrs]				
5.1	Network security techniques	2	Chalk & Talk	Black Board
5.2	Firewalls	1	Chalk & Talk	Black Board
5.3	Intrusion Detection Systems	2	Lecture	PowerPoint
5.4	Administering security	1	Lecture	PowerPoint
5.5	Security planning	1	Chalk & Talk	Black Board
5.6	Risk analysis	2	Chalk & Talk	Black Board
5.7	Steps of a risk analysis	2	Lecture	PowerPoint
5.8	Physical security	1	Chalk & Talk	PowerPoint

MAPPING OF COs WITH POs

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

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr. G. RAJKUMAR
****

Self Learning Course–Major	**ARTIFICIAL INTELLIGENCE**	**Code:**
218003527		

SEMESTER V   **Addl.**

Credits 4

Objectives:-
   ✍ *To understand the basic concepts the Artificial intelligence and expert system.*

UNIT - I:

Introduction - AI technique – the level of the model – Criteria for success – Defining the problem as a state space search – Production systems – Problem characteristics – Production System characteristics.

UNIT - II:

Heuristic Search Techniques: Generate and Test – Hill Climbing – Best First Search – Problem Reduction – Constraint Satisfaction – Means Ends Analysis.

UNIT - III:

Knowledge Representation Issues: Representations and Mapping - Approaches to Knowledge Representation – Issue in Knowledge Representation – The Frame Problem.

UNIT - IV:

Using Predicate Logic: Representation Simple Facts in logic - Computable functions and Predicates – Resolution.

UNIT - V:

Representing Knowledge Using Rules: Procedural versus Declarative Knowledge – Logic Programming – Forward versus Backward Reasoning – Control Knowledge.

TEXT BOOK:
01. Elaine Rich, Artificial Intelligence, Tata McGraw – Hill Edition,1991.

Unit-I	Chapter 1, 2	1.1-1.5, 2.1-2.4.
Unit-II	Chapter 3	3.1- 3.6,
Unit-III	Chapter 4	4.1, 4.2, 4.4.
Unit-IV	Chapter 5	5.1,5.3, 5.4
Unit-V	Chapter 6	6.1, 6.2, 6.3, 6.5.

REFERENCE:
01. Mishkoff (Hendry), Understanding of Artificial Intelligence, S. Chand Publications, 2000.
02. Nilson, Principles of Aritificial Intelligence, Narosa publications, New Delhi - 2002.

****

Core Subject	**WEB PROGRAMMING**	Code: 212703601
	SEMESTER VI	**5 Hrs/Week**
		Credits 4

PREAMBLE:
  ✎ *To include the basic knowledge in HTML JavaScript, Visual Basic script, and ASP.NET.*

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 basic concepts HTML tags. formatting tags, Table tags, Form tags – Frame tags.	Up to K3
CO2	Apply the knowledge to implement JavaScript concepts functions, objects, properties and conditional and looping statements.	Up to K3

CO3	Analyze and able to understand the window object ,The location object ,The history object , The document object ,The form object ,The image object data object and math object.	Up to K3
CO4	Demonstrate to develop the skills of VB Script identifies ,VB Script language elements ,VB Script operators, Testing conditions in VB Script , Executing VB Script loops, Function and Sub statement ,VB Script functions.	Up to K3
CO5	Make use of ASP.NET, Creating an ASP.NET Application, WebControls, Rich Web Controls, Validating User Input, ADO.NET Object Model,ADO Extensions,methods and properties.	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[15 Hrs]**

Introduction to HTML – Global attributes – Document structure tags – Formatting tags – Text–Level formatting block – Level formatting tags – List tag – Hyperlink tags – Image and Image map tags – Table tags – Form tags – Frame tags.

UNIT – II: **[15 Hrs]**

Introduction to Java Script – Use of scripting language – Java Script programming – Conventions – The Java Script languages – Using identifiers – Using functions, objects and properties – Programming with Java Script – Expressions – Operators – Controlling your Java Scripts – Java Script reserved words – Using Java Script statements – Java Script and web browsers – When scripts execute – Where to put your scripts.

UNIT – III: **[15Hrs]**

The window object – Window object properties – Window object methods – Window object events – The location object – The history object – The document object – The document object properties – Document objects methods – Java Script object arrays – The form object – Form object properties – Using objects to manipulate form – Elements – The image object – Image object example – Using the image constructor – Java Script objects – Using the data object – Using the math object.

UNIT – IV: **[15 Hrs]**

Introduction to VB Script – VB Script identifies – Objects, properties, methods and events in VB Script – Using built in objects and functions – Using properties – VB Script language elements – VB Script variables – Forming expressions in VB Script – Using VB Script operators. Testing conditions in VB Script – Executing VB Script loops – Other VB Script statement – Call statement – Dim statement – Function and Sub statement – On–Error statement – VB Script functions.

UNIT – V: **[15 Hrs]**

Getting Started with ASP.NET-Introducing ASP.NET—Advantages of ASP.NET- Creating an ASP.NET Application. Using Web Controls: Label control-TextBox control-CheckBox and CheckBoxList controls-Radio Button and Radio Button-List controls-List Box control-Drop Down List control-HyperLink control-Image control. Using Rich Web Controls: Using the AdRotator Control-Properties of the AdRotator control-Using the Calendar Control-Properties of the Calendar control-.Validating User Input: Using the Required Field Validator Control-Using the Compare Validator Control-Using the Custom Validator Control.ADO.NET Object Model-Using ADO Extensions (ADOX)-Standard ADOX objects-ADOX properties-ADOX methods-Using ADOX objects.

TEXT BOOK:
01.Eric Ladd and JIM O'Donnell, Using HTML 4, XML and JAVA 1.2, Platinum Edition, et al., Prentice Hall of India Private Limited, New Delhi – 110001, 2003.

Unit-I	Chapter 3
Unit-II	Chapter 18
Unit-III	Chapter 19
Unit-IV	Chapter 33 (835 to 847)

02.ASP.NET Bible by mridula Parihar and et al. published by Hungry Minds © 2002.

Unit-V	Chapter 2 , 3,4,6,8,12 **(Specified Topics only)**

REFERENCES:
01.Bob Breedlov etal, Web Programming Unleashed, 1st Edition, etal., Sams Net Publishing, 1996.
02.Noel Jerke and Micheal Hatmaker, VBSCRIPT The Interactive Course, Jonney Anderson, Techmedia Publications, 2002.
03.ASP.NET: The Complete Reference, Matthew MacDonald · Robert Standefer, MC Graw Hill Publication,2002.

WEB RESOURCES: (URLs)

01.https://www.javatpoint.com/java-tutorial

02.https://www.w3schools.com/java

03.https://www.geeksforgeeks.org/java-tutorial/

04.https://www.javatpoint.com/java-programs

05.https://www.tutorialspoint.com/asp.net/index.htm

06.https://dotnettutorials.net/course/asp-net-core-tutorials/

07.https://www.tutorialsteacher.com/core/dotnet-core

PEDAGOGY: Chalk and talk , PPT, Discussion , Assignment, Demo, Quiz, Case study

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Mod ule	Topic	No. of Lecture	Content Delivery Method	Teaching Aids
UNIT – I [15 Hrs]				
1.1	Introduction to HTML, Global attributes	2	Lecture	PowerPoint
1.2	Document structure tags Formatting tags , Text–Level formatting	2	Chalk & Talk	Black Board
1.3	block – Level formatting tags	2	Chalk & Talk	Black Board
1.4	List tag	2	Lecture	Power point
1.5	Hyperlink tags	1	Lecture	Power point
1.6	Image and Image map tags	2	Lecture	Power point
1.7	Table tags	2	Chalk & Talk	Black Board
1.8	Form tags, Frame tags.	2	Chalk & Talk	Black Board
UNIT – II [15 Hrs]				
2.1	Introduction to Java Script , Use of scripting language	2	Chalk &Talk	Black Board
2.2	Java Script programming, Conventions, The Java Script languages, Using identifiers.	2	Chalk & Talk	Black Board
2.3	Using functions, objects and properties ,Programming with Java Script	1	Lecture	Power point
2.4	Expressions – Operators	2	Lecture	Power point
2.5	Controlling your Java Scripts	1	Chalk & Talk	Black Board
2.6	Java Script reserved words	1	Chalk & Talk	Black Board
2.7	Using Java Script statements	2	Lecture	Power point
2.8	Java Script and web browsers	2	Chalk & Talk	Black Board
2.9	When scripts execute – Where to put your scripts.	2	Lecture	Power point
UNIT – III [15 Hrs]				
3.1	The window object ,Window object properties	1	Chalk & Talk	Black Board
3.2	Window object methods, Window	2	Chalk & Talk	Black Board

	object events , The location object ,The history object ,The document object ,The document object properties, Document objects methods .			
3.3	Java Script object arrays , The form object , Form object properties.	2	Lecture	Power point
3.4	Using objects to manipulate form, Elements	2	Lecture	Power point
3.5	The image object, Image object example.	2	Chalk & Talk	Black Board
3.6	Using the image constructor	2	Lecture	Power point
3.7	Java Script objects ,Using the data object	2	Chalk & Talk	Black Board
3.8	Using the math object.	2	Lecture	Power point
UNIT – IV [15 Hrs]				
4.1	Introduction to VB Script, VB Script identifiers	2	Chalk & Talk	Black Board

4.2	Objects, properties, methods and events in VB Script	2	Chalk & Talk	Black Board
4.3	Using built in objects and functions – Using properties	1	Chalk & Talk	Black Board
4.4	VB Script language elements ,VB Script variables, Forming expressions in VB Script	2	Chalk & Talk	Black Board
4.5	Using VB Script operators,	2	Lecture	Power point
4.6	Testing conditions in VB Script ,Executing VB Script loops	2	Chalk & Talk	Black Board
4.7	Other VB Script statement ,Call statement , Dim statement , Function and Sub statement	2	Chalk & Talk	Black Board
4.8	On–Error statement , VB Script functions.	2	Chalk & Talk	Black Board
UNIT – V [15 Hrs]				
5.1	Getting Started with ASP.NET: Introducing ASP.NET, Advantages of ASP.NET,	2	Chalk & Talk	Black Board
5.2	Creating an ASP.NET Application. Using Web Controls : Label control,TextBox control, CheckBox and CheckBoxList controls-RadioButton and RadioButton	2	Chalk & Talk	Black Board
5.3	ListBox control, DropDownList control, HyperLink control, Image control.	2	Lecture	Power point

5.4	Using Rich Web Controls: Using the AdRotator Control,	1	Lecture	Power point
5.5	Properties of the AdRotator control,	1	Chalk & Talk	Black Board
5.6	Using the Calendar Control, Properties of the Calendar control,	1	Chalk & Talk	Black Board
5.7	Validating User Input: Using the RequiredFieldValidator Control, Using the CompareValidator Control	2	Lecture	Power point
5.8	Using the CustomValidator Control.ADO.NET Object Model,	2	Lecture	Power point
5.9	Using ADO Extensions (ADOX)-Standard ADOX objects,ADOX properties,ADOX methods,Using ADOX objects.	2	Lecture	Power point

MAPPING OF COs WITH POs

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

3- Strong   2- Medium   1- Low

COURSE DESIGNER: Dr. S. SELVAM
****

Core Lab 212703602	**PROJECT**	Code:

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 to 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 Computer Applications.

Internal = 40 Marks   External = 60 Marks

      Report = 30   Report = 50

      Viva   = 10   Viva   = 10

      Total   = 40   Total   = 60

****

Core Lab	**WEB PROGRAMMING LAB**	
Code:212703603		
	SEMESTER VI	**6 Hrs/Week**
		Credits 5

PREAMBLE:

☞ *Web Programming lab is intended to enhance the knowledge in website creation. To acquire the proficiency in developing website using different technologies. To gain knowledge in both client-side and server-side scripting.*

LIST OF EXERCISES:

HTML

    01. Table Creation
    02. Hyperlinks
    03. Loading Images
    04. Frame creation
    05. Use Applet code

VB SCRIPT

    06. Create an array using VBScript.
    07. Create sub procedure and function procedure using VBScript.
    08. Display the months using date and time function.
    09. Using built-in function.
    10. Write program using IF-THEN, IF-ELSE, FOR-NEXT, SELECT-CASE statement.
    11. Looping through the HTML tags.

JAVA SCRIPT

    12. Create an alert message using JavaScript.
    13. Create background changes using Button in JavaScript.
    14. Random background button.
    15. Text background changes on mouse over.
    16. Clock that runs in status bar using JavaScript.
    17. JavaScript data using buttons.
    18. Selecting URL from pull-down menu.

19. On mouse over pop-up description.
20. JavaScript Cookies.
21. JavaScript Browser detection.

ACTIVE SERVER PAGES(ASP)

22. To process the student attendance status using ASP.NET.
23. Create a static or dynamic menu web page using ASP.NET.
24. To process the Electricity Bill using ADO.NET
25. Generate reports in ASP.NET.

REFERENCES:

01. Eric Ladd and JIM O'Donnell, Using HTML 4, XML and JAVA 1.2, Platinum Edition, et al., Prentice Hall of India Private Limited, New Delhi – 110001, 2003.
02. Kogent Learning Solutions Inc "ASP.Net 4.0 in Simple Steps" 2013 Reprint Edition.
03. Richard Leincker –"Using ASP.Net" – 2005 5th Reprint Edition.

WEB RESOURCES:

01. http://www.srmuniv.ac.in/sites/default/files/files/Object_Oriented_Programming_LAB.pdf
02. http://www.becbapatla.ac.in/ece/lab/C++_Lab_Manual.pdf
03. https://www.w3schools.in/cplusplus-tutorial/constructors-destructors/

PEDOGOGY: Chalk and talk, LCD Projector, Discussion, Interactive Teaching.

COURSE DESIGNER: Dr. S. VIJAYALAKSHMI
****

Core Subject   DATA WAREHOUSING AND DATA MINING
Code: 212703604

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

PREAMBLE:

   ? *To learn various data mining tasks and techniques.*
   ? *To acquire the knowledge for using principles of data retrieval from large databases through data mining.*

UNIT –I: **[15 Hrs]**

    Introduction: Need for Data mining - Data mining - Kinds of data can be mined - Data mining Functionalities -Technologies used in Data mining-Major issues in Data mining.

Getting to Know Your Data: Data objects and Attribute types - Basic Statistical Descriptions of Data Mining.

UNIT – II: **[15 Hrs]**

Measuring Data Similarity and Dissimilarity: Data Matrix versus Dissimilarity Matrix - Dissimilarity of Numeric Data: Minkowski Distance - Cosine Similarity

Data Preprocessing: An Overview - Preprocess the data – Data Cleaning – Data Integration - Data Reduction - Data Transformation and data discretization: Data Transformation Strategies Overview.

UNIT – III: **[15 Hrs]**

Data Warehousing and Online Analytical Processing: Data Warehouse-Differences between Operational Database Systems and Data Warehouses -A Multitier Architecture of data warehouse, data warehouse models-Extraction Transformation and Loading.

Data Warehouse Modeling: Data Cube: A Multidimensional Data Model -Stars, Snowflakes, and Fact Constellations: Schemas for Multidimensional Data Models- OLAP Operations- Data Warehouse Design: A Business Analysis Framework for Data Warehouse Design - Data Warehouse Implementation: Indexing OLAP data – Efficient Processing of OLAP Queries-OLAP server architecture.

UNIT – IV: **[15 Hrs]**

Mining Frequent Patterns, Associations and Correlations: Apriori Algorithm- Finding Frequent Item sets by Confined Candidate Generation- Generating Association Rules from Frequent Item sets.

Classification: Definition –General approach to classification – Decision Tree Induction - Attribute Selection Measures-Tree Pruning.
Cluster Analysis: Definition–overview of basic clustering methods – Partitioning Methods: k-Means: A Centroid - Based Technique.

UNIT – V: **[15 Hrs]**

Data Mining Trends and Research Frontiers: Mining Other Kinds of Data: Mining Spatial Data -Mining Multimedia Data - Mining Text Data - Mining Web Data.

Data Mining Applications - Data Mining and Society -Trends in Data mining.

TEXT BOOK:

01.Jiawei Han, Micheline Kamber, and Jian Pei, "Data mining Concepts and Techniques", Third Edition Morgan Kaufmann Publishers, 2012.

UNIT	CHAPTER/SECTIONS
I	1(1.1,1.2,1.3,1.4,1.5,1.7), 2(2.1, 2.2)
II	2(2.4), 3(3.1, 3.2, 3.3,3.4, 3.5, 3.6)
III	4(4.1.1, 4.1.2, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.5, 4.3.1, 4.4.2, 4.4.3,4.4.4)
IV	6(6.2, 6.2.1, 6.2.2), 8(8.1.1, 8.1.2, 8.2.1,8.2.2, 8.2.3), 10(10.1.1, 10.1.3, 10.2.1)
V	13(13.1.3,13.3, 13.4, 13.5)

REFERENCES:

01.Jiawei Han and Micheline Kamber: 2009. ―Data Mining Concepts and Techniques‖ Second Edition, Elsevier.

02.G. K. Gupta: 2006. ―Introduction to Data Mining with Case Studies‖, Easter Economy Edition, Prentice Hall of India.

03.BERSON, ALEX & SMITH, STEPHEN J: 2012. ―Data Warehousing, Data Mining, and OLAP‖, TMH Pub. Co. Ltd, New Delhi.

WEB RESOURCES:

01.https://www.tutorialspoint.com/data_mining

02.https://www.javatpoint.com/data-mining

03.https://www.guru99.com/data-mining-tutorial.html

PEDOGOGY: Chalk and talk, LCD Projector, Desktop Computer with JDK.

COURSE CONTENTS & TEACHING/LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [15 Hrs]				
1.1	Introduction Need for Data mining Data mining	1	Chalk & Talk	Black Board
1.2	Kinds of data can be mined	2	Lecture	PowerPoint
1.3	Data mining Functionalities	2	Lecture	Black Board
1.4	Technologies used in Data mining	2	Lecture	PowerPoint
1.5	Major issues in Data mining	2	Lecture	PowerPoint
1.6	Getting to Know Your Data: Data objects and Attribute types	3	Lecture	PowerPoint
1.7	Basic Statistical Descriptions of Data Mining	3	Lecture	PowerPoint
UNIT – II [15 Hrs]				
2.1	Measuring Data Similarity and Dissimilarity: Data Matrix versus Dissimilarity Matrix	2	Lecture	PowerPoint
2.2	Dissimilarity of Numeric Data:	2	Lecture	PowerPoint

	Minkowski Distance			
2.3	Cosine Similarity	2	Lecture	PowerPoint
2.4	Data Preprocessing: An Overview Preprocess the data	2	Lecture	PowerPoint
2.5	Data Cleaning Data Integration	3	Lecture	PowerPoint
2.6	Data Reduction	2	Lecture	PowerPoint
2.7	Data Transformation and data discretization: Data Transformation Strategies Overview.	2	Lecture	PowerPoint
UNIT – III [15 Hrs]				
3.1	Data Warehousing and Online Analytical Processing: Data Warehouse	1	Lecture	PowerPoint
3.2	Differences between Operational Database Systems and Data Warehouses	2	Lecture	PowerPoint
3.3	A Multitier Architecture of data warehouse	3	Lecture	PowerPoint
3.4	Data warehouse models	1	Lecture	PowerPoint
3.5	Extraction Transformation and Loading.	1	Lecture	PowerPoint
3.6	Data Warehouse Modeling: Data Cube: A Multidimensional Data Model	2	Chalk & Talk	Black Board
3.7	Stars, Snowflakes, and Fact Constellations: Schemas for Multidimensional Data Models - OLAP Operations	2	Lecture	PowerPoint
3.8	Data Warehouse Design: A Business Analysis Framework for Data Warehouse Design	1	Chalk & Talk	Black Board
3.9	Data Warehouse Implementation: Indexing OLAP data	1	Lecture	PowerPoint
3.10	Efficient Processing of OLAP Queries- OLAP server architecture	1	Chalk & Talk	Black Board
UNIT – IV [15 Hrs]				
4.1	Mining Frequent Patterns, Associations and Correlations: Apriori Algorithm	1	Chalk & Talk	Black Board

4.2	Finding Frequent Item sets by Confined Candidate Generation	2	Lecture	PowerPoint
4.3	Generating Association Rules from Frequent Item sets	2	Lecture	PowerPoint
4.4	Classification: Definition –General approach to classification	1	Lecture	PowerPoint
4.5	Decision Tree Induction - Attribute Selection Measures- Tree Pruning.	3	Chalk & Talk	Black Board

4.6	Cluster Analysis: Definition– overview of basic clustering methods	3	Lecture	PowerPoint
4.7	Partitioning Methods: k- Means: A Centroid- Based Technique.	3	Chalk & Talk	Black Board

UNIT – V [15 Hrs]				
5.1	Data Mining Trends and Research Frontiers: Mining Other Kinds of Data: Mining Spatial Data	2	Lecture	PowerPoint
5.2	Mining Multimedia Data Mining Text Data	3	Lecture	PowerPoint
5.3	Mining Web Data	2	Lecture	PowerPoint
5.4	Data Mining Applications	3	Chalk & Talk	Black Board
5.5	Data Mining and Society	3	Lecture	PowerPoint
5.6	Trends in Data mining	2	Chalk & Talk	Black Board

MAPPING OF COs WITH POs

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

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr. S. VIJAYALAKSHMI
****

Elective II- Major   **2.1 MOBILE COMPUTING**
Code: 212703605

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

PREAMBLE:

? *To learn the basics of mobile computing technique and gain the knowledge on the protocols used for mobile communications.*

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 basic concepts of mobile computing.	Up to K3
CO2	To explore the generations of telecommunication systems in wireless networks.	Up to K3
CO3	Understand the basic principle of satellite orbits.	Up to K3
CO4	To identify a routing protocol for a given Ad-hoc network.	Up to K3

| **CO5** | Understand the functionality of transport and application layers. | Up to K3 |

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

Introduction: Mobile Computing and its Applications – Signals – Antennas - Signal Propagation – Cellular Systems - Medium Access Control: Motivation for a Specialized MAC – SDMA – FDMA – TDMA (excluding types of TDMA) – CDMA – Comparison of S/T/F/CDMA.

UNIT – II: **[12 Hrs]**

Telecommunication Systems: GSM – Mobile Services – System Architecture – radio interface - Protocols – Localization and Calling – Handover – Security – GPRS – Services – Architecture Reference Model.

UNIT – III: **[12 Hrs]**

Satellite Systems: History – applications – GEO – LEO – MEO – routing – localization – handover – Broadcast Systems: Digital audio broadcasting – digital video broadcasting.

UNIT – IV: **[12 Hrs]**

Mobile Network Layer: Mobile IP – Entities and Terminology – IP Packet Delivery - Tunneling and encapsulation – Reverse Tunneling – IPv6 – DHCP, Mobile ad-hoc networks: Routing – Destination sequence distance vector – dynamic source routing – alternative metrics – overview ad-hoc routing protocols.

UNIT – V: **[12 Hrs]**

Mobile Transport Layer: Traditional TCP: congestion control – slow start – fast retransmit/fast recovery - Classical TCP Improvements – Indirect TCP – Snooping TCP - Mobile TCP – Fast Retransmit / Recovery – Transmission / Timeout Freezing – Selective Retransmission – Transaction oriented TCP. Wireless Application Protocol: Architecture – WDP – WTLS – WTP – WSP – WAE – wireless markup language – WML script – WAP 2.0.

TEXT BOOK:

01.Jochen Schiller, "Mobile Communication", 2nd Edition, Addison-Wesley, An imprint of Pearson Education.

UNIT	CHAPTERS

I	1.1, 2.2 – 2.4, 2.8, 3.1 – 3.3, 3.4.1 – 3.4.4, 3.5, 3.6
II	4.1
III	5.1 – 5.6, 6.3, 6.4
IV	8.1 – 8.3
V	9.1, 9.2, 10.3.1 – 10.3.8, 10.6

REFERENCES:

01. William Stallings, "Wireless Communications and Networks", Second, Edition, Pearson Education, New Delhi.
02. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012.
03. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems",Thomson Asia Pvt Ltd, 2005.

WEB RESOURCES: (URLs)

01.https://www.tutorialspoint.com/mobile_computing/index.htm
02.https://www.javatpoint.com/mobile-computing
03.https://ccsuniversity.ac.in/bridge-library/pdf/Mobile_Computing_Notes_-All.pdf
04.https://www.studocu.com/row/document/dedan-kimathi-university-of-technology/bachelor-of-science-in-information-technology/cit-3101-mobile-computing-lecture-notes/4931426

PEDOGOGY: Chalk and Talk, Power point presentation, Videos and Animation

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	Mobile computing – Introduction	1	Lecture	PowerPoint
1.2	Mobile applications	1	Chalk & Talk	Black Board
1.3	Signals and Antennas	2	Chalk & Talk	Black Board
1.4	Signal propagation	2	Lecture	PowerPoint
1.5	Cellular systems	2	Lecture	PowerPoint
1.6	MAC	1	Lecture	PowerPoint
1.7	SDMA & FDMA	1	Chalk & Talk	PowerPoint
1.8	TDMA & CDMA	1	Lecture	PowerPoint
1.9	Comparison	1	Chalk & Talk	PowerPoint
UNIT – II [12 Hrs]				
2.1	Telecommunication systems – Introduction	1	Chalk &Talk	Black Board
2.2	GSM Architecture	2	Chalk & Talk	Black Board
2.3	Mobile services	1	Lecture	PowerPoint
2.4	System architecture	2	Lecture	PowerPoint
2.5	Handover	2	Chalk & Talk	Black Board
2.6	Security	1	Chalk & Talk	Black Board
2.7	GPRS	1	Lecture	PowerPoint
2.8	Architecture	2	Lecture	PowerPoint

	UNIT – III [12 Hrs]			
3.1	Satellite systems – Introduction	1	Chalk & Talk	Black Board
3.2	History	1	Chalk & Talk	Black Board
3.3	Applications	2	Lecture	PowerPoint
3.4	GEO	2	Lecture	PowerPoint
3.5	LEO	1	Chalk & Talk	Black Board
3.6	MEO	1	Chalk & Talk	Black Board
3.7	Handover	1	Lecture	PowerPoint
3.8	Digital audio broadcasting	2	Chalk & Talk	PowerPoint
3.9	Digital video broadcasting	1	Lecture	PowerPoint
	UNIT – IV [12 Hrs]			
4.1	Mobile network layer – Introduction	1	Chalk & Talk	Black Board
4.2	Mobile IP	2	Chalk & Talk	Black Board
4.3	Entities and terminology	1	Lecture	PowerPoint
4.4	Tunneling	2	Chalk & Talk	Black Board
4.5	IPv6	1	Chalk & Talk	Black Board
4.6	DHCP	2	Lecture	PowerPoint
4.7	Destination sequence distance vector	2	Lecture	PowerPoint
4.8	Dynamic source routing	1	Chalk & Talk	Black Board
	UNIT – V [12 hrs]			
5.1	Mobile Transport layer – Introduction	1	Chalk & Talk	Black Board
5.2	Traditional TCP	1	Chalk & Talk	Black Board
5.3	Classical TCP improvements	1	Lecture	PowerPoint
5.4	WAP	2	Lecture	PowerPoint
5.5	Architecture	2	Chalk & Talk	Black Board
5.6	Wireless Markup Language	2	Chalk & Talk	Black Board
5.7	WML script	2	Lecture	PowerPoint
5.8	WAP 2.0	1	Chalk & Talk	PowerPoint

MAPPING OF COs WITH POs

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

3 - Strong   2 - Medium   1- Low

COURSE DESIGNER: Dr. G. RAJKUMAR

****
****

ELECTIVE –II Major	**2.2 CLOUD COMPUTING**	Code: 212703606
	SEMESTER VI	**4 Hrs/Week**
		Credits 4

PREAMBLE:

✍ *To learn cloud computing to store, manage, process, share, and collaborate data and information with high speed and accuracy.*

✍ *To acquire knowledge in general concepts of Cloud Computing and to familiarize with virtualization and cloud 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	Explicate cloud computing reference model, Service oriented computing, Utility oriented Computing and Application development and System development	Up to K3
CO2	Compare the difference between parallel and distributed computing, and depicts Architecture for Parallel Processing and Elements of Distributed Computing, RPC, Service Oriented Computing, Models of Inter Process Communication.	Up to K3
CO3	Grasp basic idea of virtualization, characteristics of Virtualized environments and its pros and cons.	Up to K3
CO4	Elucidate the cloud reference model, types of clouds, cloud interoperability and standard.	Up to K3
CO5	Exemplify cloud applications like scientific, business and consumer applications, CRM and ERP, social networking, media applications, multiplayer online gaming	Up to K3

K1- Knowledge K2 – Understand K3-Apply

UNIT – I: **[12 Hrs]**

Introduction - Cloud Computing at a Glance – The Vision of Cloud Computing- Defining a Cloud – Cloud Computing Reference Model – Characteristics and Benefits – Historical Developments – Distributed Systems – Virtualization – Web 2.0 – Service Oriented Computing – Utility Oriented Computing - Building Cloud Computing Environments – Application Development – Infrastructure and System Development – Computing Platforms and Technologies – Amazon Web Services – Google App Engine – Microsoft Azure – Hadoop

UNIT – II: **[12 Hrs]**

Principles of Parallel and Distributed Computing – Eras of Computing – Parallel Vs. Distributed Computing – Elements of Parallel

Computing – What is Parallel Processing? – Hardware Architecture for Parallel Processing – Approaches to Parallel Programming – Levels of Parallelism – Elements of Distributed Computing – General Concepts and Definitions – Components of a Distributed System – Architectural Styles for Distributed Computing – Models for Inter Process Communication – Technologies for Distributed Computing – Remote Procedure Call – Distributed Object Frameworks – Service Oriented Computing.

UNIT – III: **[12 Hrs]**

Virtualization: Introduction – Characteristics of Virtualized Environments – Taxonomy of Virtualization Techniques – Execution Virtualization – Other Types of Virtualizations – Virtualization and Cloud Computing – Pros and Cons of Virtualization – Technology Examples – Xen: Para Virtualization, VM Ware: Full Virtualization, Microsoft Hyper-V.

UNIT – IV: **[12 Hrs]**

Cloud Computing Architecture – Introduction – Cloud Reference Model – Architecture – Infrastructure / Hardware as a Service – Platform as a Service – Software as a Service - Types of Clouds – Public Clouds – Private Clouds – Hybrid Clouds – Community Clouds - Economics of the Cloud – Open Challenges – Cloud Definition – Cloud Interoperability and Standards – Scalability and Fault Tolerance - Security, Trust and Privacy – Organizational Aspects.

UNIT – V: **[12 Hrs]**

Cloud Applications: Scientific Applications – Healthcare: ECG Analysis in the Cloud – Biology: Protein Structure Protection – Geo science: Satellite Image Processing.

Business and Consumer Applications: CRM and ERP – Productivity – Social Networking – Media Applications – Multiplayer Online Gaming.

TEXT BOOK:

01.Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi:2016. ―Mastering Cloud Computing‖ MC Graw Hill Education (India) Private Ltd,.

UNIT	CHAPTER/SECTIONS

I	1 (1.1, 1.1.1, 1.1.2, 1.1.4, 1.1.5, 1.2, 1.2.1 to 1.2.5, 1.3, 1.3.1, 1.3.2, 1.4, 1.4.1 to 1.4.4)
II	2 (2.1, 2.2, 2.3, 2.3.1 to 2.3.4, 2.4, 2.4.1 to 2.4.4, 2.5, 2.5.1 to 2.5.3)
III	3 (3.1, 3.2, 3.3, 3.3.1, 3.3.2, 3.4, 3.5, 3.6, 3.6.1 to 3.6.3)
IV	4 (4.1,4.2,4.2.1 to 4.2.4, 4.3,4.3.1 to 4.3.4, 4.4,4.5,4.5.1 to 4.5.5)
V	10 (10.1, 10.1.1, 10.1.2, 10.1.4, 10.2, 10.2.1 to 10.2.5)

REFERENCES:

01. Rajkumar Buyya, James Broberg, Andrzej Goscinski:2016. Cloud Computing Principles and Paradigms‖, Wiley India Pvt Ltd.
02. TobyVelte, Anthony Velte, Robert Elsenpeter :2009. ―Cloud Computing - A Practical Approach‖, TMH.
03. George Reese: 2009. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud: Transactional Systems for EC2 and Beyond (Theory in Practice)‖, O'Reilly
04. Kris Jamsa- 2014. Cloud Computing, Jones & Bartlett student Edition.

WEB RESOURCES:
1. http://www.ibm.com/cloud/learn/what-is-cloud-computing
2. https://www.geeksforgeeks.org/cloud-computing/
3. https://www.tutorialspoint.com/cloud_computing/

PEDOGOGY: Chalk and talk, LCD Projector, Desktop Computer with JDK.

COURSE CONTENTS & TEACHING / LEARNING SCHEDULE

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT – I [12 Hrs]				
1.1	Introduction Cloud Computing at a Glance	1	Chalk & Talk	Black Board
1.2	The Vision of Cloud Computing Defining a Cloud	1	Lecture	PowerPoint
1.3	Cloud Computing Reference Model Characteristics and Benefits	2	Lecture	Black Board
1.4	Historical Developments Distributed Systems	1	Lecture	PowerPoint
1.5	Virtualization	1	Lecture	PowerPoint
1.6	Web 2.0 Service Oriented Computing Utility Oriented Computing	1	Lecture	PowerPoint
1.7	Building Cloud Computing Environments Application Development Infrastructure and System Development	1	Lecture	PowerPoint
1.8	Computing Platforms and	1	Chalk &	Black

	Technologies		Talk	Board
1.9	Amazon Web Services Google App Engine	2	Lecture	PowerPoint
1.10	Microsoft Azure Hadoop	1	Lecture	PowerPoint
UNIT – II [12 Hrs]				
2.1	Principles of Parallel and Distributed Computing	1	Lecture	PowerPoint
2.2	Eras of Computing Parallel Vs. Distributed Computing	1	Lecture	PowerPoint
2.3	Elements of Parallel Computing What is Parallel Processing?	1	Lecture	PowerPoint
2.4	Hardware Architecture for Parallel Processing Approaches to Parallel Programming	2	Lecture	PowerPoint

2.5	Levels of Parallelism Elements of Distributed Computing	1	Lecture	PowerPoint
2.6	General Concepts and Definitions Components of a Distributed System Architectural Styles for Distributed Computing	2	Lecture	PowerPoint
2.7	Models for Inter Process Communication Technologies for Distributed Computing	1	Lecture	PowerPoint
2.8	Remote Procedure Call Distributed Object Frameworks	2	Lecture	PowerPoint
2.9	Service Oriented Computing	1	Lecture	PowerPoint
UNIT – III [12 Hrs]				
3.1	Virtualization: Introduction Characteristics of Virtualized Environments	2	Lecture	PowerPoint
3.2	Taxonomy of Virtualization Techniques	2	Lecture	PowerPoint
3.3	Execution Virtualization	1	Lecture	PowerPoint
3.4	Other Types of Virtualizations	1	Lecture	PowerPoint
3.5	Virtualization and Cloud Computing	1	Lecture	PowerPoint
3.6	Pros and Cons of Virtualization	1	Chalk & Talk	Black Board
3.7	Technology Examples	1	Lecture	PowerPoint
3.8	Xen: Para Virtualization	1	Chalk & Talk	Black Board
3.9	VM Ware: Full Virtualization	1	Lecture	PowerPoint
3.10	Microsoft Hyper-V	1	Chalk & Talk	Black Board
UNIT – IV [12 Hrs]				
4.1	Cloud Computing Architecture: Introduction	1	Chalk & Talk	Black Board
4.2	Cloud Reference Model Architecture	1	Lecture	PowerPoint
4.3	Infrastructure / Hardware as a Service Platform as a Service	1	Lecture	PowerPoint
4.4	Software as a Service	1	Lecture	PowerPoint
4.5	Types of Clouds: Public Clouds, Private Clouds, Hybrid Clouds	2	Chalk & Talk	Black Board
4.6	Community Clouds Economics of the Cloud Open Challenges	2	Lecture	PowerPoint
4.7	Cloud Definition Cloud Interoperability and Standards	1	Chalk & Talk	Black Board
4.8	Scalability and Fault Tolerance	1	Lecture	PowerPoint

4.9	Security, Trust and Privacy	1	Chalk & Talk	Black Board
4.10	Organizational Aspects	1	Lecture	PowerPoint

<div align="center">UNIT – V   [12 Hrs]</div>

5.1	Cloud Applications: Scientific Applications	2	Lecture	PowerPoint
5.2	Healthcare: ECG Analysis in the Cloud	2	Lecture	PowerPoint
5.3	Biology: Protein Structure Protection	1	Lecture	PowerPoint
5.4	Geo science: Satellite Image Processing	1	Chalk & Talk	Black Board
5.5	Business and Consumer Applications: CRM and ERP	2	Lecture	PowerPoint
5.6	Productivity	1	Chalk & Talk	Black Board
5.7	Social Networking	1	Lecture	PowerPoint
5.8	Media Applications	1	Chalk & Talk	Black Board
5.9	Multiplayer Online Gaming	1	Lecture	PowerPoint

<div align="center">

MAPPING OF COs WITH POs

</div>

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

<div align="center">Strong – 3   Medium – 2   Low – 1</div>

COURSE DESIGNER: Dr.S.VIJAYALAKSHMI

****

Part – IV	**PHP WITH MY SQL LAB**	Code: 214403627
Skill Based Elective-IV	**SEMESTER VI**	**2 Hrs/Week**
		Credits 2

Preamble:-
  ? ***To obtain knowledge about PHP applications and database connection with MYSQL.***

1. Write a PHP program using controls and functions.

2. Develop a PHP program and check message passing mechanism between pages.

3. Design a PHP program using String function and Arrays.

4. Develop a PHP program using parsing functions.

5. Write a PHP program and check Regular Expression, HTML functions, Hashing functions.

6. Develop a PHP program and check File System functions, Network functions, Date and time functions.

7. Design a PHP program using session.

8. Develop a PHP program using cookie and session.

9. Write a server side PHP program that displays marks, total, grade of a student in tabular format by accepting user inputs for name, number and marks from a HTML form.

10. Write a PHP program that adds products that are selected from a web page to a shopping cart.

11. Write a PHP program to access the data stored in a my sql table.

12. Write a PHP program interface to create a database and to insert a table into it.

13. Write a PHP program using classes to create a table.

14. Write a PHP program to upload a file to the server.

15. Write a PHP program to create a directory, and to read contents from the directory.

16. Database connectivity in PHP with MySQL

17. Insertion, updating and Deletion of rows in MySQL tables

18. Select data from MySQL and put result in an HTML Table

REFERENCES:

01. The PHP Complete Reference – Steven Holzner –5th Edition ,Tata McGraw-Hill,2008.

02. Web Design – A Beginners Guide, Wendy Willard, 5th Edition ,Tata McGraw Hill, 2013.

WEB RESOURCES: (URLs):

01. https://www.scribd.com/document/358790219/PHP-Practical-Exercise\ 02.
https://www.tutorialspoint.com/php/php_questions_answers.htm
03. https://studyglance.in/labprograms/pythonlabprograms.php
04. https://codelabs.greycampus.com/php/php-lab/

PEDOGOGY: Chalk, Talk, Power point presentation, Videos

COURSE DESIGNER: Dr. S. SELVAM
****