

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
CBCS and OBE Pattern
(Those who join from 2022-2023 onwards)

SEMESTER – I				
Part	Subject Code	Title of the paper	Hours	Credits
I	22UTAL11/ 22UHN11/ 22USNL11	Tamil/ Hindi/French	06	04
II	22UENA11/ 22UENB11	English through Prose & Short Story – Stream- A English through Prose & Short Story – Stream- B	05	04
III	22UCSC11	Core: 1 Programming in C	05	04
	22UCSC21	Core: 2 PC Hardware and Troubleshooting	04	03
	22UCSP11	Core Lab: 1 Programming in C–Practical	05	03
	22UCSA11	Allied: 1 Digital Computer Fundamentals	03	03
IV	22UFCE11	FC – Personality Development	1	1
	22UCSH12	Communication Skill	1	-
	22UBRC11	Bridge Course	-	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NCC/NSS/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	---	---
		Total	30	23
SEMESTER – II				
I	22UTAL22/ 22UHN12/ 22USNL22	Tamil/ Hindi/ French	06	04
II	22UENA22/ 22UENB22	English through Prose & Poetry – Stream – A English through Prose & Poetry – Stream – B	05	04
III	22UCSC32	Core: 3 Object Oriented Programming with C++	05	04
	22UCSC42	Core: 4 Web Designing	04	03
	22UCSP22	Core Lab: 2 Object Oriented Programming with C++ - Practical	05	03
	22UCSA22	Allied: 2 Discrete Mathematics	03	03
IV	22UFCH22	FC – Social Responsibility and Global Citizenship	1	1
	22UCSH12	Communication Skill	1	1
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB12	Extension Activities NSS/NCC/Phy.Edn./YRC/ ROTARACT/AICUF/Nature Club	-	1
		Total	30	24

SEMESTER – III				
III	22UCSC53	Core: 5 Programming in JAVA	05	04
	22UCSC63	Core: 6 Data Structures and Algorithms	05	04
	22UCSC73	Core: 7 Operating System	04	03
	22UCSP33	Core Lab: 3 Programming in JAVA–Lab	05	03
	22UCSA33	Allied: 3 Computer Organization and Architecture	04	03
IV	22UCSN13	NME: 1 Web Designing (For Arts students)	03	02
	22UCSS13	SBE: 1 Quantitative Aptitude and Reasoning	03	02
	22UFCE33	FC – Environmental Studies	01	01
V	22UNCC/NSS/ PHY.EDU./YRC/ ROT/ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	-
	22UARE14	ARISE		
		Total	30	22
SEMESTER – IV				
III	22UCSC84	Core: 8 Web Programming	05	04
	22UCSC94	Core: 9 Relational Data Base Management System	05	04
	22UCSD04	Core: 10 Computer Networks	05	04
	22UCSP44	Core Lab: 4 Web Programming – Lab	05	03
	22UCSA44	Allied: 4 Operation Research	03	03
IV	22UCSN24	NME: 2 Web Designing (For Science Students)	03	02
	22UCSS24	SBE: 2 Open Source Technology	03	02
	22UFCH44	FC – Religious Literacy and Peace Ethics	01	01
V	22UNCC/NSS/PHY. EDU./YRC/ ROT/ACF/NCB24	Extension Activities NCC/NSS/Phy.Edn./ YRC/ROTARACT/AICUF/Nature Club	-	01
	22UARE14	ARISE	-	01
		Total	30	25
SEMESTER – V				
III	22UCSD15	Core: 11 Big Data Analytics using R	05	05
	22UCSD25	Core: 12 Mobile Computing	05	05
	22UCSD35	Core: 13 Dot NET Programming	05	05
	22UCSD45	Core: 14 Network Security and Cryptography	05	04

	22UCSP55	Core Lab: 5 Dot NET Programming – Lab	05	03
	22UCSE15	Core Elective:1 1. Introduction to Data Science 2. Artificial Neural Networks 3. Linux Shell Programming	03	03
IV	22USSI16	Soft Skills	02	-
		Total	30	25
SEMESTER – VI				
III	22UCSD56	Core: 15 Software Engineering	05	04
	22UCSD66	Core: 16 Data Mining and Ware Housing	04	04
	22UCSD76	Core: 17 Mobile Application Development	05	04
	22UCSD86	Core: 18 Python Programming	05	03
	22UCSD86	Core: 19 Major Project	01	02
	22UCSP66	Core Lab: Python Programming – Lab	05	03
	22UCSE26	Core Elective: 2 1.Internet of Things (IoT) 2.Artificial Intelligence 3. Software Testing	03	03
IV	22USSI16	Soft Skills	02	02
		Total	30	25

Credits for each Semester

Semester	I	II	III	IV	V	VI	Total
Credits	23	24	22	25	25	25	144

Self-Learning Courses

S.No	Semester	Sub. Code	Title of the Paper	Credits
1.	III	22UCSSL3	Software Project Management	3
2.	IV	22UCSSL4	Cloud Computing	3
3.	V	22UCSSL5	System Administration and Maintenance	3
4.	VI	22UCSSL6	Ethical Hacking	3

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF COMPUTER SCIENCE

(Outcome Based Syllabus under CBCS Structure for the students admitted from the Academic Year 2022 -2023)

Program Specific Outcome (PSO)

On successful completion of B.Sc Computer Science Programme, the students will be able to

- PSO1:** Apply fundamental principles and methods of Computer Science for analysing, designing, developing and testing the software solutions and products with creativity and sustainability
- PSO2:** Apply modern computing tools, skills and techniques necessary for critical problem solving and analyzing industrial and societal requirements
- PSO3:** Work as a member or leader in diverse teams in multidisciplinary environment.
- PSO4:** Employ modern computer languages, environments, and platforms for lifelong learning and a zest for higher studies
- PSO5:** Provide innovative approaches for solving problems in different domain.

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS

Programming in C

Class : B. Sc.(Comp. Sci.)
Semester : I
Subject Code : 22UCSC11

Part III : Core - 1
Hours : 75
Credits: 04

Objectives:

The course enables the students to

- Write the programs for a given problem by using operators and basic statements.
- Demonstrate to use decision making and looping statements to solve the problems.
- Exercise user defined functions to solve real-time problems.
- Integrate pointers, static memory allocations and dynamic memory management functions.
- Implementing file operations in C programming for database programs.

UNIT - I

15 Hours

Overview of C - Introduction - Character set - C tokens - keywords & Identifiers - Constants - Variables - Data types - Declaration of variables - Defining Symbolic Constants - Operators - Arithmetic Expressions - Evaluation of expressions - Type conversion in expressions – operator precedence & associativity - Mathematical functions – Formatted/Unformatted input and output statement.

UNIT - II

15 Hours

Decision Making and Branching: Conditional and Control statements - One- and Two-Dimensional Array - Multidimensional arrays - Declaring and initializing string variables - Writing strings to Screen - Arithmetic operations on Character - String handling Functions.

UNIT - III

15 Hours

Functions: Definition of functions - Return values and their types - Function declaration & call - Category of functions - No Arguments and no return values - Arguments but no return values - Arguments with return values - No Arguments but Returns a value- Functions that return multiple values - Nesting of functions - Recursion.

UNIT - IV

15 Hours

Structure: Definition - Structure initialization - Copying & Comparing structure variables - Operations on individual members - Arrays of structures - Arrays within structures - Structures within structures - Structures and functions - unions - size of structures - Bit fields. Pointers - Understanding pointers - Accessing the Address of variable - Declaring and initializing pointers - accessing a variable through its pointers - Chain of pointers - pointer expressions.

UNIT - V

15 Hours

File management in C - Defining and opening a file - closing a file - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments – preprocessor.

Book for Study

1. Balagurusamy. E, *Programming in ANSI C*, Tata McGraw Hill, Fifth Edition, 2011.

Books for Reference

1. Kamthane. N Ashok, *Programming with ANSI and Turbo C*, Pearson Edition Publication, 2002.

2. MullishHenry. L. Cooper L Hubert, *The Spirit of C*, Jaico Publication House, 1996.

Teaching Methods

- Lecturing
- Group Discussion
- Learning by Doing
- Video tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Apply the basic concepts of OOPs for writing the programs for a given problem (K3)

CO2: Understand decision making and looping statements to solve a problem. (K2)

CO3: Apply user defined functions to solve real-time problems. (K3)

CO4: Integrate pointers, static memory allocations and dynamic memory management functions. (K3)

CO5: Implementing file operations in C programming for database programs. (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
CO4	3	3	2	2	2	3	3	-	-	2	2	2	-	24
CO5	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand Total of COs with POs PSOs														110
Grand total with PSOs and POs														2.20
Mean value of COs with PSOs and POs = _____ =														
(110/50)														
Number of COs relating with PSOs & POs														

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.20
Observation	COs of Programming in C – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Programming in C – Lab

Class : B. Sc. (Comp. Sci.)

Part III : Core Lab-1

Semester : I

Hours : 75

Subject Code: 22UCSP11

Credits : 03

Objectives:

- Understand and trace the execution of programs written in C language.
- Develop C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Develop programs that perform operations using derived data types.
- Write diversified solutions to real-time problems using C language.

Lab Exercises

1. Program to check the prime number
2. Program to print Fibonacci series
3. Program to print factorial value
4. Program using Decision Control Structures
5. Program using Looping Control Structures
6. Program to reverse the given number
7. Program to find biggest of three numbers
8. Program for swapping of two numbers
9. Program using String Functions
10. Program using Arrays
11. Program using Functions
12. Program using Pointers
13. Program using Structure
14. Program using Union
15. Program using file concepts
16. Write a program to open a file
17. **Write a program to close a file**

Teaching Methods

- Learning by Doing
- Demonstration

Course Outcome (CO)

On successful completion of the course students will be able to

CO1: Understand and trace the execution of programs written in C language. (K1)

CO2: Write the C code for a given algorithm. (K3)

CO3: Apply arrays and perform pointer arithmetic, and use the pre-processor. (K3)

CO4: Develop programs that perform operations using derived data types. (K3)

CO5: Write diversified solutions to real-time problems using C language. (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	3	2	1	2	1	3	3	-	-	1	1	1	-	20
CO2	3	2	2	2	1	3	2	-	-	2	2	2	-	21
CO3	3	2	2	1	1	3	2	-	-	2	3	2	-	22
CO4	3	2	2	1	2	3	2	-	-	2	3	2	-	23
CO5	3	2	2	1	2	3	3	-	-	2	2	3	-	25
														11
	Grand total with PSOs and POs Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs \& POs}} = (111/50)$													2.22

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.22
Observation	COs of Programming in C Lab – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS

PC Hardware and Troubleshooting

Class : B. Sc.(Comp.Sci.)

Part III : Core - 2

Semester : I

Hours : 60

Subject Code : 22UCSC21

Credits : 03

Objectives:

The course enables the students to

- Gain knowledge about the PC components
- Gain knowledge about the Mother boards & Input Devices.
- To gain knowledge about the Output Devices
- Implement troubleshooting techniques to overcome the problems faced in it
- Understand maintenance techniques and tools

UNIT - I

(12 Hours)

CPU: Layout of a typical desktop – Types of computer – Generation of computer. Power supply: Connecting the power supply – AT style power connections – Drive power connections – Voltage tolerances. Parallel port –Serial port – Accelerated graphics port.

UNIT - II

(12 Hours)

Input Devices: Keyboard – Construction – Interfaces. Mouse: Construction – Mechanical and optical - Mechanical sensors – Trackball. Motherboard: structure of motherboard – Types of motherboard.

UNIT - III

(12 Hours)

Printers: Dot matrix printers – Ink jet printers – Laser/LED printers–Monitors – Types of monitor – CRT – Laser – LED – Graphics adapter – VGA – SGA – Digital Visual Interface (DVI) – Video In Video Out (VIVO). Modem: Basic modem construction and operation – Internal and external modem.

UNIT - IV

(12 Hours)

Troubleshooting: the CPU – Audio and Video – Monitor Display – Hard Disk Drive – Installation of Hardware - Power Supply Function and Operation. OS Installation and preventive maintenance – Troubleshooting tools and Techniques – Basic Data Recovery and Disaster Recovery.

UNIT - V

(12 Hours)

PC Maintenance: Creating Backup – Creating System Recovery – Removing unused File and Programs - Disk Cleanup – Disk Defragmenting – Maintenance Scheduling.

Books for Study:

1. Stephen J. Bieglow, *Troubleshooting, Maintaining and repairing PCs*, Tata Mc-Graw 5th Edition, 2013.

Books for Reference:

1. Craig Zacker & John Rourke, *PC Hardware: The complete reference*, Tata Mc - Graw hill, 1st Edition 2012.
2. Govindarajulu. B, *IBM PC and clones: Troubleshooting and maintenance*, Tata Mc - Graw Hill, 2nd Edition, 2012.

Course Outcome (CO)

On successful completion of the course students will be able to

CO1: Identify the main components of PC, power supplies and various ports (K2)

CO2: Explain the function of motherboard and working mechanisms of Keyboard and mouse. (K2)

CO3: Illustrate the types of Monitors, Printers, graphic adapters and their mechanisms (K2)

CO4: Categorize various modems, soundcards and their working. (K2)

CO5: Solve the problems faced in PC by applying the troubleshooting methods. (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	2	1	2	1	1	3	2	-	-	2	1	1	-	16
CO2	2	2	2	1	1	3	2	-	-	2	2	2	-	19
CO3	3	3	2	1	2	3	3	-	-	2	3	3	-	25
CO4	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	Grand Total of COs with Pos PSOs													104
	Grand total with PSOs and POs													2.08
	Mean value of COs with PSO and POs =————— = (104/50) Number of COs relating with PSOs & Pos													

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.08
Observation	COs of PC Hardware and Troubleshooting – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS

Digital Computer Fundamentals

Class : B.Sc (Comp.Sci)

Part III : Allied -1

Semester : I

Hours : 45

Subject Code : 22UCSA11

Credit : 03

Objectives:

The course enables the students to

- Write a digital logic and apply it to solve real life problems.
- Understand the basic concepts combinational logic circuits.
- Identify the concept of ALU and Data processing model in various processors.
- Identify the basic working principles of flip-flops with different architecture.
- Design real-time circuits by using shift registers and counters.

UNIT – I

09 Hours

Number Systems and Codes: Number System – Base Conversion – Binary Codes – Code Conversion. Digital Logic: Logic Gates – Truth Tables – Universal Gates.

UNIT – II

09 Hours

Boolean Algebra: Laws and Theorems – SOP, POS Methods – Simplification of Boolean Functions – Using Theorems, K-Map, Prime – Implicant Method – Binary Arithmetic: Binary Addition – Subtraction – Various Representations of Binary Numbers – Arithmetic Building Blocks – Adder – Subtractor.

UNIT – III

09 Hours

Combinational Logic: Multiplexers – Demultiplexers – Decoders – Encoders – Code Converters – Parity Generators and Checkers.

UNIT – IV

09 Hours

Sequential Logic: RS, JK, D, and T Flip-Flops – Master-Slave Flip-Flops. Registers: Shift Registers – Types of Shift Registers.

UNIT – V

09 Hours

Counters: Asynchronous and Synchronous Counters - Ripple, Mod, Up-Down Counters– Ring Counters. Memory: Basic Terms and Ideas –Types of ROMs – Types of RAMs.

Books for Study

1. V. Rajaraman and T. Radhakrishnan, Digital Computer Design, Prentice Hall of India, 2001.
2. D.P. Leach and A.P. Malvino, Digital Principles and Applications, TMH, 5th Edition, 2002.

Books for Reference

1. Mano Morris. M, *Digital Logic and Computer Design*, PHI, 2017.
2. T.C. Bartee, Digital Computer Fundamentals, 6th Edition, Tata McGraw Hill, 1991.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video Tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Analyze digital logic and apply it to solve real life problems. (K4)

CO2: Apply combinational logic circuits for a required circuit (K3)

CO3: Understand the concept of ALU and Data processing model in various processors. (K2)

CO4: Identify the basic working principles of flip-flops with different architecture. (K2)

CO5: Develop real-time circuits by using shift registers and counters. (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	3	3	2	2	1	3	3	-	-	2	1	1	-	21
CO2	2	2	2	2	1	3	2	-	-	2	2	2	-	20
CO3	3	3	2	2	2	3	3	-	-	2	3	3	-	26
CO4	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	Grand Total of Cos with Pos PSOs													111
	Grand total with PSOs and POs Mean value of COs with PSO and POs = $\frac{111}{50}$ = (111 / 50) Number of COs relating with PSOs & POs													2.22

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.22
Observation	COs of Digital Principles – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Object Oriented Programming with C++

Class : B.Sc (Comp.Sci)

Part II : Core - 3

Semester : II

Hours : 75

Subject Code : 22UCSC32

Credits : 04

Objectives:

The course enables the student to

- Understand the need of object oriented design principles in problem solving.
- Understand the dynamic memory management techniques using pointers, constructors, destructors.
- Develop programs using the concept of function overloading, operator overloading, virtual functions and polymorphism.
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
- Use various OOPs concepts with file stream classes.

UNIT I

15 Hours

Introduction to C++ - key concepts of Object - Oriented Programming - Advantages - Object Oriented Languages - I/O statement - declarations. Control Structures:-Decision Making and looping Statements - Functions: Inline functions - Function Overloading – string functions - Miscellaneous functions.

UNIT II

15 Hours

Classes and objects: Declaring Objects - Defining Member Functions - Static Member Variables and Functions - Array of objects - friend functions - Overloading member functions - Bit fields and classes - Constructor and destructor.

UNIT III

15 Hours

Operator overloading unary operators - overloading friend functions - type conversion - inheritance: types of inheritance - single, multilevel, multiple, hierarchal, hybrid inheritance - virtual base classes – abstract classes.

UNIT IV

15 Hours

Pointers - Declaration - Pointer to Class, Object - This pointer - Pointers to derived classes and Base classes - Arrays - Characteristics - Array of classes - Memory models - new and delete operators - dynamic object - binding , polymorphism and virtual functions.

UNIT V

15 Hours

Files - file stream classes - file modes - Sequential read / write operations - Binary and ASCII Files - Random Access Operation - Templates

Book for Study

1. Balagurusamy. E, *Objects Oriented Programming with C++*, Sixth Edition, Tata McGraw-Hill Publication, 2013.

Books for Reference

1. Kamthane N Ashok, *Object Oriented Programming with ANSI and Turbo C++*, Pearson Education Publication, 2003.
2. LitvinMaria, Gray, *C++ for You*, Vikas Publication, 2002.
3. Hubbard R. John, *Programming with C*, Second Edition, TMH Publication, 2002.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video Tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Understand the need of object oriented design principles in problem solving. (K2)

CO2: Understand dynamic memory management techniques using pointers, constructors, destructors (K2)

CO3: Develop programs using the concept of function overloading, operator overloading, virtual functions and polymorphism. (K3)

CO4: Develop programs using the concept of early and late binding, usage of exception handling, generic programming. (K3)

CO5: Apply various OOPs concepts with file stream classes. (K3)

K1=RememberK2=UnderstandK3=ApplyK4=AnalysisK5=EvaluateK6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	1	1	2	2	1	3	3	-	-	2	1	1	-	17
CO2	2	2	2	2	1	3	2	-	-	2	2	2	-	20
CO3	3	3	2	1	2	3	3	-	-	2	3	3	-	25
CO4	3	2	2	1	2	3	3	-	-	2	2	1	-	21
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	Grand Total of COs with POs PSOs													107
	Grand total with PSOs and POs													
	Mean value of COs with PSOs and POs = $\frac{107}{50}$ = 2.14													
	Number of COs relating with PSOs & POs													

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.14
Observation	COs of Object Oriented Programming with C++ – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
Object Oriented Programming Lab

Class : B.Sc (Comp. Sci)

Semester : II

Subject Code : 22UCSP22

Part III : Core Lab - 2

Hours : 75

Credits : 03

Objectives:

The course enables the student to

- Apply C++ features to program design and implementation.
- Demonstrate practical experience in developing object-oriented solutions.
- Apply object oriented techniques to solve bigger computing problems.
- Develop programs using file concepts
- Implement file concepts to develop projects with real world problems.

Lab Exercises

1. Armstrong Number Generation
2. To print right angled pyramid of numbers
3. Printing the name randomly on screen with colored text
4. Generating N Random Numbers between two specified numbers
5. To find total number of days from given month of year
6. Program using inline function
7. To generate random numbers
8. Implementing the use of reference variables
9. Write a program for magic Number
10. Program using Classes and Objects
11. Program using *Constructor and destructor*
12. Program using *inheritance*
13. Program using operator overloading
14. Program using Files
15. Case Study

Course Outcomes:

On successful completion of the course students will be able to

CO1: Apply C++ features to program design and implementation. (K3)

CO2: Understand the OOPs concepts in developing solutions. (K2)

CO3: Apply object oriented concepts to solve computing problems. (K3)

CO4: Develop programs using file concepts. (K3)

CO5: Implement file concept to develop projects with real world problems. (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	3	2	2	1	-	3	3	-	-	2	1	1	-	18
CO2	2	2	2	2	1	3	2	-	-	2	2	2	-	20
CO3	3	3	2	2	2	3	3	-	-	2	3	3	-	26
CO4	3	2	2	2	1	3	3	-	-	2	2	1	-	21
CO5	3	3	3	1	2	3	3	-	-	2	2	2	-	24
	Grand Total of Cos with Pos PSOs													109
	Grand total with PSOs and POs Mean value of COs with PSOs and POs = $\frac{109}{50}$ =(109/50) Number of COs relating with PSOs & POs													2.18

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.18
Observation	COs of Object Oriented Programming Lab Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

WEB DESIGNING

Class : B.Sc. (Comp. Sci.)

Part III : Core 4

Semester : II

Hours : 60

Subject Code : 22UCSC42

Credit : 03

Objectives:

The course enables the student to

- Apply basic HTML concepts in creating program.
- Understand the tags of creating tables, frames and forms.
- Apply CSS concept in design smart web site.
- Understand the usage of Photoshop tools.
- Understand the techniques for image enhancement

UNIT I

12 Hours

HTML: Introduction to HTML – title – document tags – fonts – background - heading level tags - creating paragraph and line break – Editing & Formatting.

UNIT II

12 Hours

Creating hypertext link and link list – using Inline images – relative URL – horizontal rules.- Tables - Rows – Columns – Cell columns – Centering table. – Frames – Creating two row frames – forms - Image map.

UNIT III

12 Hours

Dynamic HTML: CSS: Introduction – Inline styles – Creating styles sheets with the style element – Conflicting styles – Linking external style sheets – Positioning Elements – Backgrounds – Element Dimensions – Text flow and the Box model – user style sheets.

UNIT IV

12 Hours

PHOTOSHOP : Introduction – images basics – file formats – GIF, JPEG, PNG, PSG - color palette – layers – creating new images – brushes – grids and guides – scaling and positioning images – moving and merging layers – tool palette – screen capturing – grey styling – animation.

UNIT V

12 Hours

Scanning images – Adding text to the images – designing icons – creating background images – color models – color depths – color calibration – creating gradients – oil paint effect.

Book for Study

1. Schrand Richard, *Photoshop 6 Visual Jumbstrat*, Adobe Press, 2000.

Books for Reference

1. Deitel, *Internet and World Wide Web How to program*, Prentice Hall, Third Edition, 2003.

2. Reinhardt Robert, Lentz Warren John, *Flash 5 Bible*, Hungry Minds Inc, 2001.

3. Meenakshi GM, *Web Graphics*, SCITECH Publication, 2007.

Course Outcomes:

On successful completion of the course students will be able to

CO1: Develop static web pages using HTML program. (K3)

CO2: Develop web pages with table, frame and form tags. (K3)

CO3: Develop Web site using CSS Concepts. (K3)

CO4: Design invitation and flex for real time scenario(K3)

CO5: Understand the concept of Internet. (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	1	1	2	2	-	3	3	-	-	2	2	2	-	18
CO2	2	2	2	2	1	3	3	-	-	2	2	2	-	21
CO3	3	3	2	2	2	3	3	-	-	3	3	3	-	27
CO4	3	2	2	2	1	3	3	-	-	2	3	1	-	22
CO5	3	3	3	2	2	3	3	-	-	2	3	2	-	26
	Grand Total of Cos with POs PSOs													114
	Grand total with PSOs and POs Mean value of COs with PSOs and POs = ————— = (114 / 50) Number of COs relating with PSOs & POs													2.28

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.28
Observation	COs of Web Designing – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
DISCRETE MATHEMATICS

Class : B.Sc (Comp.Sci)

Part III : Allied- 2

Semester : II

Hours : 45

Subject Code : 22UCSA22

Credits : 03

Objectives:

The course enables the student to

- Understand the concept of Set Theory
- Understand the concept of Mathematical Logic
- Apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction.
- Solve mathematical properties formally via the formal language of propositional logic and predicate logic.
- Apply the concepts of tree and graph algorithms to solve problems.

UNIT I

09 Hours

Set theory: Introduction-set & its Elements - set Description - types of sets - Venn-Euler Diagrams - set operations & law of theory - fundamental products-partitions of sets min sets - Algebra of sets and Duality-inclusion and exclusion principle.

UNIT II

09 Hours

Mathematical logic: Introduction - prepositional calculus – Basic logical operations - Tautologies- Contradiction- Argument- method of proof- predicate calculus.

UNIT III

09 Hours

Relations: Binary Relations- set operation on relations-Type of Relations – Partial Order relation - Equivalence relation - Composition of relations-Functions: Types of functions - invertible functions -Composition of functions.

UNIT IV

09 Hours

Languages - Operations on languages - Regular Expressions and regular Languages – Grammar: Types of Grammars - Finite state machine - Finite-State automata.

UNIT V

09 Hours

Graph theory: Basic terminology-paths, Cycle & Connectivity- sub Graphs: Types Of graphs - Representation of graphs in compute memory- trees- properties of trees- Binary Trees - traversing Binary trees –Computer Representation of general trees.

Book for study

1. Sharma J.K, *Discrete Mathematics*, Macmillan India Ltd, Second Edition, 2005.

Books for Reference

1. Themblay J.P, Manohar R, *Discrete Mathematics Structures with Applications to Computer Science*, McGraw Hill International, 1987.
2. Venketaramen. M.K, Sridharan.N, Chadarasekaran. N, *Discrete Mathematics*, The National Publishing Company, Chennai.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Construct simple mathematical proofs and possess the ability to verify them. (K1)

CO2: Have substantial experience to comprehend formal logical arguments. (K2)

CO3: Apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction. (K3)

CO4: Solve mathematical properties formally via the formal language of propositional logic and predicate logic. (K4)

CO5: Use tree and graph algorithms to solve problems. (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
Outcome														
CO1	1	1	2	-	1	3	3	-	-	1	1	1	-	14
CO2	2	2	2	-	1	3	2	-	-	2	2	2	-	18
CO3	3	3	2	-	2	3	3	-	-	2	2	3	-	23
CO4	3	2	2	-	1	3	3	-	-	2	2	1	-	19
CO5	3	3	3	-	2	3	3	-	-	2	2	2	-	23
Grand Total of Cos with Pos PSOs														97
Grand total with PSOs and POs														
Mean value of Cos with PSOs and POs = $\frac{97}{45}$ = (97 / 45)														2.15
Number of COs relating with PSOs & POs														

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.15
Observation	COs of Discrete Maths– Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

PROGRAMMING IN JAVA

Class : B.Sc.(Comp. Science)
Semester : III
Subject Code : 22UCSC53

Part III : Core -5
Hours : 75
Credits : 4

Objectives:

The course enables the students to

- Understand Programming structure, Object oriented concepts, JVM and Datatypes
- Apply the fundamentals of programming such as conditional and iterative execution, classes & methods.
- Apply the unique features of java such as interfaces, multithreaded programming & packages.
- Design User Interface Components.
- Develop database and file management concepts

UNIT I

15 Hours

Fundamentals of objects-oriented programming: Basic concepts of object oriented programming. **Overview of java:** simple java program - structure - java tokens-statements - javavirtualmachine-Constants–Variables–DataTypes–Operator–Expressions.

UNIT II

15 Hours

Decision Making and Branching-Decision Making and Looping classes, objects and methods:Defining class-creating object-accessing class members–constructors-method overloading - static members - Nesting of methods – Inheritance - Overriding methods – Arrays -String-Vectors.

UNIT III

15 Hours

Interfaces: Multiple Inheritances - Defining Interface - Extending Interface –Implementing Interface - Accessing Interface variables - **Packages:** Java API Packages - user defined packages –**Multithreaded programming:**Introduction-Creating threads -Extending the thread class-Lifecycle of a thread –thread exceptions-thread priority -synchronization.

UNIT IV

15 Hours

Managing Errors and Exceptions: Types of Errors – Exceptions - syntax of Exception Handling. Swing - The MVC Architecture and Swing, Layout Manager and Layouts, The JComponent class, Components – JButton, JLabel, JText, JText Area, JCheck Box and JRadio Button, JList, JCombo Box, JMenu and JPopup Menu Class, JMenuItem and JCheck Box JMenuItem, JRadio Button JMenuItem, JScroll Bar, Dialogs (Message, confirmation, input), JFile Chooser, JColor Chooser, Event Handling: Event sources, Listeners, Mouse and Keyboard Event Handling, Adapters

UNIT V

15 Hours

Managing Input/output Files in Java: Concept of streams-Stream classes-bytestream Classes-character stream classes-Exception-creation of files-reading/writing character –Introduction to JDBC, Essential JDBC classes, Connecting to database, Inserting data in database, Retrieving data from database, deleting data in database, updating data in database, store image in the database, to retrieve image from database, to store file in database, retrieve file from database

Book for Study

1. Balagurusamy.E, Programming with Java-A Primer, Sixth Edition, 2019, TMH.

Books for Reference

1. Naughton Patrick, Schildt Hebert, *The Complete Reference Java 2*, Ninth Edition, 2014, TMH.
2. Hubbard R. John, *Programming with Java*, Second Edition, 2006, TMH.

Web References

1. https://onlinecourses.nptel.ac.in/noc22_cs47/preview
2. <https://www.geeksforgeeks.org/java/>
3. <https://docs.oracle.com/javaee/7/index.html>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO1: Understand the basic concepts to solve standalone applications (K2)

CO2: Apply Java control statements and methods for complex Programs (K3)

CO3: Design and develop applications using unique features (K6)

CO4: Ability to develop graphics applications (K6)

CO5 : Demonstrate JAVA using window components and JDBC. (K3)

K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate, K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	2	1	1	-	1	1	2	1	1	16
CO2	3	2	-	-	2	2	1	-	2	2	2	1	1	18
CO3	3	3	-	-	2	3	1	-	3	3	2	2	2	24

CO4	3	3	-	-	2	2	1	-	3	2	2	2	1	21
CO5	3	3	-	-	2	2	1	-	3	3	3	2	2	24
Grand total of COs with PSOs and POs														103
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs/ Number of COs relating with PSOs and POs=(103/50)														2.06

Strong–3, Medium–2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.06
Observation	COs of Programming in Java–Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
PROGRAMMING IN JAVA-LAB

Class : B. Sc. (Computer Science)

Semester : III

Subject Code : 22UCSP33

Part : Core Lab- 3

Hours : 75

Credits : 03

Objectives:

The course enables the students to

- Understand basics of JAVA programs and its execution.
- Develop applications on Arrays, Strings & Vectors & Patterns.
- Develop programs on Object Oriented Programming
- Design User Interface Elements
- Develop applications on JDBC.

List of Exercises

JAVA Programs on Decision Making/Looping

1. Calculating Batting Average.
2. Calculate average Marks
3. Factorial program in Java
4. Sum of N Numbers
5. Sum of Digits
6. Reverse String
7. HCF & LCM of Two Numbers
8. Food order & billing using Switch.
9. Prime Number Generation
10. Armstrong Number Generation

JAVA Programs on Arrays

11. Matrix Addition/Subtraction
12. Matrix Multiplication
13. Transpose of Matrix
14. Linear Search/Binary Search
15. Reverse a Number.

JAVA Programs on Patterns

16. Print Pyramid Star Pattern
17. Print Diamond star Pattern
18. Print Square Star Pattern
19. Hollow Inverted Right Triangle Star Pattern

JAVA Programs on Classes & Object

20. To implement stack and queue concept.
21. Dynamic polymorphism and interfaces.
22. Multithreaded producer and consumer application.
23. Customized exception and also make use of all the 5 exception keywords.
24. Program to implement Inheritance.

JAVA Programs on User Interface Elements

24. Develop a scientific calculator using swings.

25. Create a simple editor using swing.

Working on Database

26. Create Database and Tables, DDL, DML commands.

27. Working on Aggregate functions & Wild Cards.

28. Working on joins.

29. Working on Nested Queries.

30. JAVA Programs on Java Database Connectivity

31. Develop Java application to implement Insert, Update, Delete, and Search Options.

Outcomes:

On successful completion of the course the students able to

CO1: Apply Java compiler and eclipse platform to write and execute java program(K3)

CO2: Understand and Apply Object oriented features and Java concepts(K3)

CO3: Apply the concept of multithreading and implement exception handling (K3)

CO4: Access data from a Database with java program.(K3)

CO5: Develop applications using Console/I/O and File I/O, GUI applications (k6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	2	1	2	3	3	-	-	2	1	1	-	20
CO2	2	2	2	2	2	3	2	-	-	2	2	2	-	21
CO3	3	3	2	2	2	3	3	-	-	2	3	3	-	26
CO4	3	2	2	2	1	3	3	-	-	2	2	1	-	21
CO5	3	3	3	1	2	3	3	-	-	1	1	1	-	21
	Grand Total of COs wit PSOs and POs													109
	Mean Value of COs with PSOs and POs =Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(109/50)													2.18

Strong-3, Medium-2, Low - 1

Mapping Scale	1	2	3
Relation	0.01to1.0	1.01to2.0	2.01to3.0
Quality	Low	Medium	Strong
Mean Value of COs With PSOs and POs			2.18
Observation	COs of Programming in JAVA-Lab Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
DATA STRUCTURES AND ALGORITHMS

Class : B.Sc. (Comp. Science)
Semester : III
Subject Code : 22UCSC63

Part III : Core-6
Hours : 75
Credit : 4

Objectives:

The course enables the students to

- Understand and remember algorithms and its analysis procedure.
- Understand the concepts of data structures through Stack & Queue ADT
- Familiar with implementation of Linked List data structures
- Familiar with Searching and Sorting algorithms and its complexities
- Apply the concepts of advanced data structure such as binary tree, Hash and Symbol table.

UNIT I

15 Hours

Abstract Data Types – Algorithm – Algorithm Analysis – Goal of Analysis of Algorithm – Running Time Analysis – comparing Algorithms – Types of Analysis – Recursion and Back Tracking.

UNIT II

15 Hours

Stacks and Queues: Fundamentals-Stack- usage of Stack- Stack ADT- Applications-Queue- usage of Queue - Queue ADT-Operations-Applications.

UNIT III

15 Hours

Linked Lists: Linked List– Linked List ADT – Comparison of linked list with Arrays – Singly linked list – Doubly linked list –Circular linked list.

UNIT IV

15 Hours

Searching and Sorting: Types of Searching – Linear search types – Binary Search – Interpolation search – Sorting – Classification of sorting – Bubble sort- Insertion sort –Selection sort – shell sort – merge sort – heap sort –quick sort – Radix sort – Topological sort – External sorting.

UNIT V

15 Hours

Tree – Binary Tree – Binary tree traversal – Generic trees (N-ary trees) – Threaded Binary tree – Expression tree – Binary search tree - AVL tree – Symbol table – Hashing – Hash Functions – Hash tables – Collisions – Collision resolution techniques.

Book for Study:

1. Karumanchi Narasimha, *Data Structures and Algorithms Made Easy Data Structure and Algorithmic Puzzles*, Second Edition, 2011, Careermonk Publications.

Books for Reference:

1. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C++*, 4th edition, 2013, Person Publications.
2. Horowitz Ellitz, Sahni Sartaj, *Data Structures*, Second Edition, 2012, Universities Press.

Web Reference:

1. <https://nptel.ac.in/courses/106106130>

2. https://w3.cs.jmu.edu/spragunr/CS240_F12/ConciseNotes.pdf
3. https://www.tutorialspoint.com/data_structures_algorithms/dsa_quick_guide.htm
4. <https://www.geektonight.com/data-structures-and-algorithms-notes/>
5. <https://www.javatpoint.com/data-structure-tutorial>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO1: Analyze the algorithm for the specific problem (K4)

CO2: Apply the functions of linear data structures. (K3)

CO3: Understand the advanced linear data structure (K2)

CO4: Implement appropriate sorting/searching technique for given problem. (K3)

CO5: Understand the hashing and function of collision (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	2	2	-	-	1	2	2	-	3	2	1	1	1	17
CO2	3	3	-	-	1	2	1	-	2	1	1	1	1	16
CO3	3	2	-	-	1	1	1	-	2	1	2	1	1	15
CO4	3	3	-	-	1	1	1	-	3	2	1	1	2	18
CO5	3	3	-	-	1	1	1	-	3	2	1	1	2	18
Grand total of COs with PSOs and POs														84
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(84/50)														1.68

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.68	
Observation	COs of Data Structures and Algorithms – Medium related with PSOs and Pos		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE
OPERATING SYSTEM

Class : B. Sc. (Comp. Sci.)

Semester : III

Subject Code: 22UCSC73

Part III : Core 7

Hours : 60

Credits : 03

Objectives:

The course enables the students to

- To acquire the basic knowledge of operating systems architecture and components and to know the various operations performed by Operating System
- Understanding the importance of Process and Scheduling
- Providing a knowledge issues in Synchronization and Deadlocks
- Describe the concept of Various Memory Management Techniques
- To gain the importance of Files, Directories and Mass Storage

Unit I

(12 Hours)

Introduction: Operating System Definition – Computer System Organization – Types of Operating System – Operating System Structures - Operating System Operation. **System Structures:** Operating System Services – System Calls – System Programs – Operating System Design and Implementation - Operation System Generation - System Boot

Unit II

(12 Hours)

Process Concept: Process Concept - Process Scheduling – Operation on Processes - Inter Process Communication - Example of IPC System – Communication in Client – Server system. **Process Scheduling:** Basic concept - Scheduling criteria - Scheduling algorithm - Thread scheduling-Multiple Processor Scheduling - Real Time CPU Scheduling - Operating system example - Algorithm evaluation

Unit III

(12 Hours)

Synchronization: Background - The Critical section problem - Peterson's solution - Semaphores – Classic problems of Synchronization. **Deadlock:** System models - Deadlock Characterization- Methods for handling deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock detection - Recovery from deadlock

Unit IV

(12 Hours)

Memory Management: Background – Swapping - Contiguous Memory allocation – Segmentation – paging. **Virtual Memory Management:** Background - Demand paging - Copy and Write-page replacement - Allocation of Frames - Thrashing

Unit V

(12 Hours)

File System: File Concept - Access Method - Directory and Structure - File Sharing - Protection. **Implementing File System:** File System Structure - File System implementation - Directory implementation - Allocation Methods - Free Space Management. **Mass Storage Structure:** Overview of Mass Storage Structure - Disk Structure - Disk Scheduling - Disk Management

Book for Study

1. Abraham Silberschatz, Peter B Galvin, Gerg Gagne, Operating System Concepts, Ninth Edition, 2018, Wiley India Private Limited.

Books for Reference

1. William Stallings, Operating System, Seventh Edition, 2010, Pearson Education.
2. William Stallings, Operating System: Internals and Design Principles, Seventh Edition, 2012, Prentice Hall India Learning Private Limited.

Web References

1. https://onlinecourses.nptel.ac.in/noc20_cs04/preview
2. <https://www.udemy.com/topic/operating-system-creation>
3. <https://in.coursera.org/learn/os-pku>
4. <https://www.javatpoint.com/best-courses-for-the-operating-system>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

- CO1:** Understand the basic concepts in varies OS. (K1)
CO2: Understand the various scheduling techniques and its executions processes. (K2)
CO3: Analyze the working principles of deadlock. (K4)
CO4: Understand the memory management techniques. (K2)
CO5: Analyze files system and mass storage structure of OS. (K4)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	1	1	1	-	1	1	2	1	1	14
CO2	3	3	-	-	1	1	1	-	2	1	2	1	1	16
CO3	3	3	-	-	1	1	1	-	2	1	1	1	1	15
CO4	3	2	-	-	2	1	1	-	1	1	1	1	1	14
CO5	3	2	-	-	2	2	1	-	1	1	1	1	1	15
Grand total of COs with PSOs and POs														74
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(74/50)														1.48

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.48	
Observation	COs of Operating System – Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
COMPUTER ORGANIZATION AND ARCHITECTURE

Class : B.Sc. (Comp. Sci)
Semester : III
Subject Code : 22UCSA33

Part III : Allied - 3
Hours : 60
Credit : 03

Objectives:

The course enables the students to

- Gain knowledge of architectural development of computer system components
- Explore functional components of CPU and their roles
- Get exposure on computer instruction formats and types
- Classify memory components with respect to their storage capacity and speed
- Explore interfacing methods for both input and output devices with CPU

UNIT – I EVOLUTION AND CLASSIFICATION

12 Hours

Mechanical calculating Machines – Vacuum Tube computers – Transistorized Computers – Integrated Circuit Computers – VLSI computers – Computer level hierarchy – The Von-Neumann model – Parallel processors

UNIT – II CPU ARCHITECTURE

12 Hours

CPU Components – Registers – Accumulator Logic Unit – Control Unit – Bus Subsystem – Input and Output subsystem – Interrupts and Interrupt service routines

UNIT – III INSTRUCTION SET ARCHITECTURES

12 Hours

Instruction Processing – Instruction Cycle – Interrupt Cycle - Instruction Formats – Instruction types – Instruction Decoding - Instruction Pipelining – Addressing modes

UNIT – IV MEMORY ARCHITECTURE

12 Hours

Types of memory – Memory hierarchy – RAM – ROM – Cache memory – Associative Memory – Secondary Storages – Virtual memory – Paging – Page replacement algorithms

UNIT – V INPUT AND OUTPUT ARCHITECTURE

12 Hours

I/O and Performance – I/O Control methods – Programmed I/O – Interrupt-driven I/O – Memory mapped I/O – Direct Memory Access – Channel attached I/O – I/O Processor - Character I/O – Block I/O – Bus operation

Book for study

1. Linda Null & Julia Lobur, The Essentials of Computer Organization and Architecture, 2015, Jones and Bartlett Learning.

Books for Reference

1. Aharon Yadin, Computer Systems Architecture, 2016, CRC Press.
2. Stanley Warford, Computer Systems, 2017, Jones and Bartlett Learning.

Web References

1. Computer Architecture and Organization-<https://nptel.ac.in/courses/106105163>
2. Computer Architecture-<https://nptel.ac.in/courses/106102157>
3. Introduction to Computer Architecture-<https://nptel.ac.in/courses/106102062>

Teaching Methods

- Lectures with notes
- Group Discussions
- Visual aids
- Assignment and Tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Review the formal evolution of computer system architectures (K1)

CO2: Explore CPU components and their interconnections (K2)

CO3: Analyze instruction formats and decoding mechanism of an instruction (K4)

CO4: Classify memory with respect to its hierarchy of capacity and speed (K3)

CO5: Explore various I/O control methods and their functional characteristics (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
CO4	3	3	2	2	2	3	3	-	-	2	2	2	-	24
CO5	3	2	3	3	2	3	3	-	-	2	2	2	-	25
Grand Total of COs with POs PSOs														112
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(112/50)														2.24

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.24
Observation	COs of this course is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
WEB DESIGNING

Class : B.Sc.(Comp. Sci.)

Part III : NME-1

Semester : III

Hours : 45

Subject Code : 22UCSN13

Credit : 02

Objectives:

The course enables the students to

- Understand and apply the basic HTML tags to create attractive web pages.
- Demonstrate to link web pages; create table and frames within the web page.
- Work with various image files and various transformation of images
- Apply various effects and making color correction with the scanned images.
- Perform simple animation in Flash environment.

UNIT I: HTML

(9 Hours)

Introduction of HTML - Writing my first HTML Page - Basic tags used in HTML: Heading Tags - Paragraph Tag - Line Break Tag - Centering Content - Horizontal Line - Preserve Formatting - Non Breaking Spaced - Elements In HTML: Elements in HTML - HTML Tag Vs Element - Formatting tags in HTML

UNIT II:

(9 Hours)

Images and incorporating images , working with Tables , Working with Lists , Working with hyperlinks - Frames and frame management - Forms and Form Management

UNIT III: PHOTOSHOP

(9 Hours)

Introduction - Getting started with Photoshop - The Photoshop Program Window: Menu bar - The Options bar - Image Window - Ruler - Palletes - The Toolbox - Working with images: Image Size - Image Resolution - Editing Images - Color Modes - Setting the Current Foreground and Background colors - File Formats

UNIT IV:

(9 Hours)

Painting Tools, Drawing Tools and Retouching Tools - Layers: Layers Palette - Working with Layers - New Layer via Cut and Copy - Hiding and Showing Layers - Flattening Images - Working with Adjustment Layers - Layer Effects - Type Tool: Changing the Type Settings - Type Masking

UNIT V: FLASH

(9 Hours)

Introduction to Flash - Flash Interface: Stage - Timeline - Library - Drawings and Symbols - Flash Project Properties - Timeline and Frames - Animation: Frame by Frame Animation - Tween Animation

Books for Study

1. C. Xavier, Web Technology and Design, 2007, New Age International publishers.
2. Schrand Richard, *Photoshop 6 visual Jumpstart*, 2000, Adobe Press. (Unit I, II&III).
3. Mohles L. James, *Flash 5.0 Graphics, Animation & Interaction*, Macromedia, 2000, World Press. (Unit IV & V).

Books for Reference

1. Deitel, *Internet and World Wide Web How to Program*, Third Edition, 2003, Prentice Hall.
2. Reinhardt Robert, Lentz Warren Jon, *Flash 5 Bible*, 2001, Hungry Minds Inc.
3. Meenakshi G M, *Web Graphics*, 2007, SCITECH Publication.

Web References

1. <https://www.geeksforgeeks.org/html-basics>
2. <https://www.educba.com/adobe-photoshop-tools>
3. <https://www.photoshopessentials.com/basics>
4. www.tutorialboneyard.com/simple-flash-animation/
5. <https://www.instructables.com/Flash-Animation-Basics>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO1: Understanding the HTML concepts. (K2)

CO2: Apply HTML tags to create static web pages including links and frames. (K6)

CO3: Analyze to work on image files using various Photoshop tools. (K4)

CO4: Apply various color effect for image manipulation (K3).

CO5: Understand the concepts of timeline motion to create simple Animation. (K4)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO2	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO3	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO4	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO5	3	3	-	-	1	3	1	-	2	1	2	1	1	18
Grand total of COs with PSOs and POs														106
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(106/50)														2.12

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.12
Observation	COs of Web Designing – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
QUANTITATIVE APTITUDE AND REASONING

Class : B.Sc. (Comp. Sci.)

Part : IV SBE - 1

Semester : III

Hours : 45

Subject Code : 22UCSS13

Credits: 2

Objectives:

The course enables the students to

- Apply the various techniques to manipulate the numerical values.
- Understand the methods to solve the problems in percentage and Time.
- Understand the methods to solve the Problems in Ratio and Speed.
- Analyze the data from the graphical output.
- Understand the techniques to improve the Analytical and Reasoning skill.

Unit I

(9 Hours)

Arithmetic: Numbers - Progressions (Sequences & Series) –Number Series- LCM and HCF Simplifications – Square roots, Cube roots, - Problems on Numbers - Average.

Unit II

(9 Hours)

Percentages – Profit & Loss - Interest (Simple and Compound) – Partnership - Time and Distance - Time and Work – Surds and Indices.

Unit III

(9 Hours)

Ratio & Proportion - Problems on Ages - Problems on Trains – Boats and Streams – Alligations or Mixture – Calendar.

Unit IV

(9 Hours)

Data Interpretation: Tabulation - Pie Charts - Bar Graphs - Line Graphs -Venn Diagrams (Syllogism).

Unit V

(9 Hours)

Reasoning: Letter and Symbols Series- Coding-Decoding- Seating Arrangement (circle) - Letter – Word Problems-Mathematical Operations (Inequality).

Books for Study

1. Aggarwal R. S, *Quantitative Aptitude for Competitive Examinations*, Seventh Revised Edition, S.Chand and Co Ltd, 2012, New Delhi.
2. Aggarwal .R. S, *Modern Approach to Verbal and Non Verbal Reasoning*”, [Revised Edition](#), S.Chand and Co Ltd., 2012, New Delhi.

Book for Reference

1. *Barron’s Guide for GMAT*, 2006, Galgotia Publication, New Delhi.

Web Reference

1. Arithmetic: <https://unacademy.com/course/course-on-quantitative-aptitude-arithmetic/MTXF8I8N>
2. Percentages: <https://www.javatpoint.com/aptitude/percentage>
3. Ratio & Proportion : <https://www.geeksforgeeks.org/ratio-and-proportion-gg/>
4. Data Interpretation(Charts): https://www.tutorialspoint.com/quantitative aptitude/aptitude_bar_charts.htm

5. Reasoning : <https://www.javatpoint.com/aptitude/problem-on-ages-1>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course, Students able to

CO1: Apply the skills to solve numerical problems. (K3)

CO2: Understand the techniques to solve the problems based on Percentage and Time.(K2)

CO3: Understand the techniques to solve the problem in Ratio and Speed. (K2)

CO4: Analyze the data of the graphical output.(K4)

CO5: Understand and solve the Analytical problems. (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

Objectives Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	1	2	1	-	2	1	1	1	1	16
CO2	3	3	-	-	2	2	1	-	2	1	1	1	1	17
CO3	3	3	-	-	2	2	1	-	1	2	1	2	1	18
CO4	3	3	-	-	2	1	1	-	1	2	1	2	1	17
CO5	3	3	-	-	1	3	1	-	2	2	1	1	1	18
Grand total of COs with PSOs and POs														86
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(86/50)														1.72

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.72	
Observation	COs of Quantitative Aptitude and Reasoning– Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514.
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : B. Sc (Comp.Sci)
Semester : III
Subject code : 22UCSSL3

Part : Self Learning Course
Hours :
Credit : 03

E-COMMERCE TECHNOLOGY

Objectives:

- Understand the basic concepts of E-commerce
- Understand the mobile technology used for M-Commerce
- Familiarize students with organizational and managerial foundations of system
- Describe the Security issues in E-Commerce
- Understand the various online transaction system

UNIT I

What is e-commerce? – E-commerce is not E-Business –the drivers – Myths You should Know – Advantages and issues in e-commerce – Benefits and Limitations of the internet – Role of E – Strategy - Integrating E -Commerce - E-Commerce Business Models – Management Implications.

Unit II

Mobile – commerce – The business of Time: What is M-Commerce? – Why wireless? – How wireless Technology is employed? – Wireless LAN – Wireless application Protocol Implications for management.

Unit III

Business – to – Business E – commerce: What is B2B E- commerce ? - Supply chain management and B2B - B2B Models – B2B Tools-EDI.

Unit IV

E- Security: Security in Cyberspace – Designing for security – How much risk you afford? – The VIRUS – Security Protection and Recovery – Role of Biometrics – How to secure your system? – Security and Terrorism.

Unit V

Getting the money: Real World cash – Electronic Money – Requirements for Internet-Based Payments – How would you like to pay? – B2B and E-Payment – M-Commerce and M payment - General Guide to E-Payment.

Book for Study

1. Awad E, Elias.M, *Electronic Commerce From Vision To Fulfillment*, Third Edition, PHI,
(Chapters: 1,6,11,13,15 Only)

Books for Reference

1. Whiteley David, *E-Commerce Strategy , Technologies And Applications*, TMH
2. Jeffrey F. Rayport, Bernard J. Jaworski, *Introduction To E-Commerce* , TMH

On Successful completion of the course, Students able to

CO1: Understand the basic concepts of E-Commerce (K2)

CO2: Understand the mobile technology used in M-Commerce(K2)

CO3: Understand the different types of E-Commerce. (K2)

CO4: Describe the different types of management information systems(K2)

CO5: Implement the various online transaction methods into real life scenario. (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	1	2	1	-	2	2	1	1	1	16
CO2	3	2	-	-	2	2	1	-	2	1	1	1	1	16
CO3	3	2	-	-	2	2	2	-	1	2	1	2	2	19
CO4	3	3	-	-	2	1	3	-	1	2	1	2	2	20
CO5	3	3	-	-	1	3	3	-	2	2	1	1	2	21
Grand total of COs with PSOs and Pos														92
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(92/50)														1.84

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.84	
Observation	COs of E-Commerce – Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE& APPLICATIONS

WEB PROGRAMMING

Class : B. Sc. (Comp. Sci.)

Semester : IV

Subject Code : 22UCSC84

Part III : Core - 8

Hours : 75

Credits : 04

Objectives:

The course enables the students to

- explore HTML elements and hyper linked web documents
- explore CSS design patterns and templates
- explore the ways of incorporating external scripts and objects with web documents
- get exposure to develop PHP scripts and applications
- get exposure on database programming and web portal design by using PHP

UNIT – I: INTRODUCTION TO WEB PROGRAMMING

15 Hours

Creating web pages and web sites – Web page uploads – Web Hosting services - Example page designs – HTML elements – HTML Tags and attributes – Structural elements – Evolution of HTML – HTML governing bodies and forums – Compatibility issues of versions - Body elements – Block elements – coding conventions – comments – Content model categories – Creating hyperlinks – HTML Form elements

UNIT – II: WEB PAGE DESIGN WITH CSS

15 Hours

Overview – CSS rules – Syntax and Styles – Class selectors – ID selectors – Span and DIV elements – Cascading – Style attributes – Style container – External CSS files – CSS properties – Color properties – RGB Values – Opacity Values – Font properties – Text Properties – Border properties

UNIT – III: WEB PAGE DESIGN WITH JAVASCRIPT

15 Hours

Characteristics of Scripting languages - History of Javascript – functions – Variables and Identifiers – Statements and Objects – Document Object Model – Forms – Controls – Accessing form control values – Reset and Focus methods – Comments – Coding conventions – Event handler attributes – Conditional statements – Loop statements – External scripts

UNIT – IV: WEB PAGE DESIGN WITH PHP

15 Hours

Essential terminology – Structure of PHP scripts – Statements – blocks – comments – Data types – operators – Conditional execution – Loop Structures – Count controlled loops – Conditional loops – Arrays – Functions – user defined functions – built-in functions – String handling functions – Array related functions – Miscellaneous functions – PHP Graphics – Pie charts – Bar charts – Line graphs

UNIT – V: WEB PORTAL DESIGN

15 Hours

Characteristics of Web portals – Web pages Vs Web portals – MySQL data types – creating databases and Table objects – Import and export database contents – Administrative interfaces and credentials – Inserting new records – edit and deletion of existing records – Connecting Database with PHP – mysqli() connector interface – feeding data through forms – report generation from databases

Books for study

1. John Dean, Web Programming with HTML 5.0, CSS and Javascript, Jones and Bartlet Learning, 2019
2. David R. Brooks, Programming in HTML and PHP, Springer 2017
3. Adrian W. West, Steve Prettyman, Practical PHP 7, MYSQL 8, Maria DB website databases, A Press 2018

Books for Reference

1. Jennifer Niderst Robbins, Learning Web Design, O'REILLY, 2018
2. Frank M. Kromann, Beginning PHP and MySQL: From novice to professional, Fifth Edition, A Press 2018

Web References

1. Internet Technology - <https://nptel.ac.in/courses/106/105/106105084/>
2. Programming with CSS and Javascript - <https://www.w3schools.com/>
3. PHP Programming with MySQL - <https://swayam.gov.in/nd2/aic20/sp32/>

Teaching Methods

- Lectures
- Group Discussion
- Assignment and Tutorials
- Visual aids

Course Outcomes:

On successful completion of the course students will be able to

CO1: Understand the concept of web pages and hyperlinked web documents (K2)

CO2: Explore various design patterns and to apply styles to static web documents (K3)

CO3: Incorporate external scripts and functional attributes to static web pages (K4)

CO4: Incorporate PHP scripts to static web pages (K4)

CO5: Develop dynamic web pages and portals (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	2	1	1	3	3	-	-	2	2	1	-	20
CO2	2	2	2	1	1	3	3	-	-	2	2	2	-	20
CO3	3	2	2	2	2	3	3	-	-	2	2	2	-	23
CO4	3	3	2	2	2	3	3	-	-	2	2	2	-	24
CO5	3	2	2	2	2	3	3	-	-	2	2	2	-	23
Grand total of COs with PSOs and POs														110
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(110/50)														2.2

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.2
Observation	COs of this course is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
WEB PROGRAMMING LAB

Class : B. Sc. (Comp. Sci.)

Semester : IV

Subject Code: 22UCSP44

Part III : Core Lab-4

Hours : 75

Credits: 03

Objectives:

The course enables the students to

- Practice HTML elements for creating static web pages
- Practice CSS styles and attributes to incorporate in static web page design
- Develop scripts and functions to be incorporated with html documents
- Develop simple interactive forms and pre-processors to be incorporated in web documents
- Develop dynamic web pages and portals by using database objects

Lab Exercises

1. Create static web page (home page) for a reputed educational Institution
2. Design web pages for a business organization and integrate all pages using hyperlinks
3. Design a simple course registration form pattern and display profile summary of the form
4. Design a simple application form by using HTML and java scripts
5. Design a simple static page to display animated images or text within bounded area
6. Design simple login form and display error message on the usage of wrong credential used
7. Design simple arithmetic calculator interface with necessary functionality by using java script
8. Design an online invitation with necessary GUI widgets and containers.
9. Develop PHP script to display simple online feedback form with 5-point metrics
10. Develop PHP script to create CSV file on submission of a typical registration form
11. Develop PHP script to upload a document to a specified location and path
12. Create login form of a typical web portal by using database connectivity
13. Create web application to display all the records of existing database
14. Create web application to search for a specified record on the existing database
15. Create web application to delete a record on the existing database

Teaching Methods

- Hands on Training
- Visual Demonstration

Course Outcome (CO)

On successful completion of the course students will be able to

CO1: Understand HTML tags and their attributes (K2)

CO2: Explore the ways to incorporate CSS files into HTML document (K3)

CO3: Apply constructs and primitives of java script for creating web pages (K3)

CO4: Develop forms and user interfaces for online data processing (K4)

CO5: Develop interactive web pages and web portals by using connectors and APIs (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs & POs
CO1	3	2	1	2	1	3	3	-	-	1	2	2	-	20
CO2	3	2	2	2	1	3	2	-	-	2	2	2	-	21
CO3	3	2	2	1	2	3	2	-	-	2	3	2	-	22
CO4	3	2	2	1	2	3	2	-	-	2	3	2	-	22
CO5	3	2	2	1	2	3	3	-	-	2	2	3	-	23
														108
	Mean Value of COs with PSOs and POs =Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(108/50)													2.16

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.16
Observation	COs of this course is strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
RELATIONAL DATABASE MANAGEMENT SYSTEM

Class : B. Sc.(Computer Science)
Semester : IV
Subject Code : 22UCSC94

Part : III Core- 9
Hours : 75
Credits : 04

Objectives:

The course enables the students to

- Understand the basics of database management systems and its architecture
- Apply data manipulation techniques through query languages
- Know the Integrity and Security measures applied on Relational Database
- Differentiate the Normalization techniques to avoid the redundancy of data
- Understand the transaction concepts and concurrency control

UNIT – I

15 Hours

Introduction: Database System Applications-DBMS Vs. File System - View of Data-Data Model-Database Languages - Database users and Administrators - Transaction Management - Database System Structure - Application Architecture. **Data Models:** Basic Concepts - Constraint-Keys- ER Diagram -Weak Entity - Extended ER Features - Design of an ER Schema - UML. **Relational Model:** Structure of Relational Databases - Relational Algebra - Views.

UNIT – II

15 Hours

SQL: Background-Basic Structure-Set Operation-Aggregate Function-Null Values-Nested Sub Queries- Views - Modification of the Database - Data Definition Language - Embedded SQL - Dynamic SQL.

UNIT-III

15 Hours

Advance SQL : Integrity and Security: Domain - Constraint - Referential Integrity - assertions – Triggers. **Security and Authorization:** Authorization in SQL - Encryption and Authentication.

UNIT – IV

15 Hours

Relational Database Design: First Normal Form - Pitfalls in Relational Database Design-Functional Dependencies (Second Normal Form) - Boyce-Codd Normal Form - Third Normal Form – Fourth Normal Form - Overall Database Design Process.

UNIT-V

15 Hours

Transaction Management: Transaction concepts - States - Serializability. **Lock based concurrency control:** Locks - Granting - Two-Phase Locking protocol. **Time stamp based protocol:** Timestamps -Timestamp ordering protocol - Dead lock handling.

Book for Study:

1. Silberschatz, H Korth, S Sudarshan, *Database System and Concepts*, seventh Edition, 2019, McGraw-Hill. .

Book for Reference:

1. Leon Alexis, Leon Mathews, *Fundamentals of DBMS*, Second Edition, 2014, Vijay Nicole Publications.

Web References:

1. SQL &RDBMS Concepts: https://www.w3schools.com/mysql/mysql_rdbms.asp

2. DBMS with web: <https://www.slideshare.net/marccdy1/webdbms-a-quick-reference>
3. Relational Database: https://en.wikipedia.org/wiki/Relational_database
4. Introduction to DBMS: <https://www.geeksforgeeks.org/dbms/>
5. Basic Concepts: <https://www.javatpoint.com/dbms-tutorial>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO 1: Understand the Entity Relationship(ER) and Relational Models for a specific application (K2)

CO 2: Build and manipulate relational database using structure query languages (K3)

CO 3: Analyze a normalized data base for a given application by incorporating various constraints like integrity and value constraints (K4)

CO 4: Differentiate the normal forms to avoid data manipulation anomalies (K3)

CO 5: Understand different transaction and concurrency control mechanism to preserve data consistency in a multiuser environment (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	2	2	1	-	2	1	1	1	1	16
CO2	3	3	-	-	1	1	1	-	2	1	2	1	1	16
CO3	3	2	-	-	1	2	1	-	1	1	1	1	1	14
CO4	3	3	-	-	1	2	1	-	2	1	1	1	1	16
CO5	3	2	-	-	1	1	1	-	2	2	1	1	1	15
Grand total of COs with PSOs and POs														77
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(77/50)														1.54

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.54	
Observation	COs of Relational Database Management System – Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
COMPUTER NETWORKS

Class : B. Sc. (Comp. Sci.)

Semester : IV

Subject Code : 22UCSD04

Part : III Core-10

Hours : 75

Credits : 04

Objectives:

The course enables the students to

- Understand the basic definitions and types of Computer Networks
- Identify different types of Transmission Media.
- Find the mechanism for error detection and correction techniques.
- Expose routing algorithms and its execution process.
- Analyses the implementations of Domain Name System.

UNIT I

15 Hours

Introduction: Definition – Types of Networks – Types of Topologies - Networking Software & Hardware - Protocol Hierarchies – Connection oriented and connectionless service. **Reference Models:** OSI Reference Model - TCP/IP Reference Model – Comparison of OSI and TCP/IP Reference Model.

UNIT II

15 Hours

PHYSICAL LAYER: Guided Transmission Media - Magnetic Media – Twisted Pair – Co-axial cable – Fiber Optics. **Wireless Transmission:** Electromagnetic spectrum – Radio Transmission – Microwave Transmission – Infrared - Light Waves. **Communication Satellite:** Geo Stationary, Medium- Earth Orbit, Low Earth Orbit Satellites.

UNIT III

15 Hours

DATA LINK LAYER: Error Detection and Correction methods. **ACCESS CONTROL SUB LAYER:** Multiple Access Protocols – Ethernet – Wireless LANs – Bluetooth.

UNIT IV

15 Hours

NETWORK LAYER: Routing Algorithm – Congestion Control Algorithm. **Transport Layer:** Elements of Transport Protocols - Internet Transport Protocols.

UNIT V

15 Hours

APPLICATION LAYER: DNS – E-mail – FTP – TELNET – HTTP.

Book for Study

1. Andrew S. Tanenbaum and Wetherall J. David, Computer Networks, 5th Edition, 2013, PHI.

Books for Reference:

1. Achyut S Godbole, Data Communications and Networks, 2nd Edition, 2011, TMH.
2. Black Uyless, Computer Networks Protocols, Standard, Interfaces, 2nd Edition, 1993, PHI.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Quiz Programming
- Video Tutorials

Web References

1. <https://nptel.ac.in/courses/106106091>
2. <https://nptel.ac.in/courses/106105183>

Course Outcomes:

On Successful completion of the course the students able to

CO1: Understand the basic concepts and definitions of computer networks. (K2)

CO2: Familiarize various transmission mediums (K2)

CO3: Understand the mechanism for error detection and correction techniques (K3)

CO4: Implement suitable routing and congestion control algorithms. (K4)

CO5: Analyze and Execute Domain Name System in real environments. (K4)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	2	2	-	3	2	2	1	2	23
CO2	3	2	-	-	2	1	2	-	2	1	1	1	1	16
CO3	3	2	-	-	2	1	2	-	1	1	2	1	1	16
CO4	3	2	-	-	2	2	2	-	2	1	2	1	1	18
CO5	3	2	-	-	1	-	1	-	1	-	-	1	1	10
Grand total of COs with PSOs and POs														83
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(83/47)														1.77

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		1.77	
Observation	COs of Computer Networks – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE
OPERATIONS RESEARCH

Class : B. Sc. (Comp. Sci.)
Semester : IV
Subject Code : 22UCSA44

Part : III Allied - 4
Hours : 45 Hours
Credits : 03

Objectives:

The course enables the students to

- Apply the Linear programming concepts.
- Analyze various Transportation problems.
- Solve mathematical formulation of assignment models.
- Analyze solutions for various Critical Path methods.
- Evaluate Queuing models.

UNIT I

9 Hours

Linear Programming Models: Mathematical formulation – graphical Solution of linear programming models –Simplex Method-Artificial Variable Techniques-Variants of Simplex method

UNIT II

9 Hours

Transportation and Mathematical formulation of transportation problem - methods for finding initial basic feasible solution – optimum solution - degeneracy.

UNIT III

9 Hours

Mathematical formulation of assignment models –Hungarian Algorithm-Variants of the Assignment problems - Integer Programming Models formulation.

UNIT IV

9 Hours

Scheduling by PERT and CPM Network Construction – Critical Path Method – Project Evaluation and Review Technique-Resource Analysis in Network Scheduling

UNIT V

9 Hours

Queuing Models: Characteristics of Queuing Models - Poison Queues-(M/M/C):(FIFO/),(M/M/C): (FIFO/),(M/M/1):(FIFO/):(M/M/2):(FIFO/) models.

Book for Study

1. Taha H.A, *Operations Research: An Introduction*, Seventh Edition, 2004, Pearson Education.

Books for Reference

1. Natrajan A.M, Balasubramani.P, Tamilarasi. A, *Operations Research*, 2005, Person Education.
2. Rath Rani Rina, *Operations Research*, 2019, First Edition.

Web Reference

1. Linear Programming Models
<https://www.cuemath.com/algebra/linear-programming/>
2. Transportation problems
<https://www.geeksforgeeks.org/transportation-problem-set-1-introduction/>
3. Hungarian algorithm

[https://www.brainkart.com/article/Solution-of-assignment-problems-\(Hungarian-Method\)_39044/](https://www.brainkart.com/article/Solution-of-assignment-problems-(Hungarian-Method)_39044/)

4. PERT and CPM

<https://www.britannica.com/topic/research-and-development/PERT-and-CPM>

5. Introduction to Operation Research: <https://nptel.ac.in/courses/110106062>

Teaching Methods:

- Lecturing
- PPTs and PDF
- Video Tutorials

Course Outcomes:

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

CO1: Apply various linear programming concepts. (K5)

CO2: Apply methods to get feasible solution. (K3)

CO3: Analyze various formats of Assignment problems. (K4)

CO4: Evaluate Critical Path. (K5)

CO5: Understand queuing process. (K2)

K1=Remember K2=Understand K3=Apply K4=Analyze K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	2	2	-	-	3	3	3	2	2	3	1	3	-	24
CO2	2	3	-	-	3	3	3	3	2	3	1	3	-	26
CO3	1	2	-	-	2	2	2	1	2	3	1	2	-	18
CO4	2	3	-	-	3	3	3	3	2	3	1	3	-	26
CO5	2	2	-	-	3	2	2	2	2	2	1	2	-	20
Grand total of COs with PSOs and POs														114
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs /Number of COs relating with PSOs and POs=(114/50)														2.28

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and Pos			2.28
Observation	COs of Operation Research – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
WEB DESIGNING

Class : B.Sc.(Comp. Sci.)

Semester : IV

Subject Code : 22UCSN24

Part III : NME - 2

Hours : 45

Credit : 02

Objectives:

The course enables the students to

- Understand and apply the basic HTML tags to create attractive web pages.
- Demonstrate to link web pages, create table and frames within the web page.
- Work with various image files and various transformation of images
- Apply various effects and making color correction with the scanned images.
- Perform simple animation in Flash environment.

UNIT I: HTML

(9 Hours)

Introduction of HTML - Writing my first HTML Page - Basic tags used in HTML: Heading Tags - Paragraph Tag - Line Break Tag - Centering Content - Horizontal Line - Preserve Formatting - Non Breaking Spaced - Elements In HTML: Elements in HTML - HTML Tag Vs Element - Formatting tags in HTML

UNIT II:

(9 Hours)

Images and incorporating images , working with Tables , Working with Lists , Working with hyperlinks - Frames and frame management - Forms and Form Management

UNIT III: PHOTOSHOP

(9 Hours)

Introduction - Getting started with Photoshop - The Photoshop Program Window: Menu bar - The Options bar - Image Window - Ruler - Palletes - The Toolbox - Working with images: Image Size - Image Resolution - Editing Images - Color Modes - Setting the Current Foreground and Background colors - File Formats

UNIT IV:

(9 Hours)

Painting Tools, Drawing Tools and Retouching Tools - Layers: Layers Palette - Working with Layers - New Layer via Cut and Copy - Hiding and Showing Layers - Flattening Images - Working with Adjustment Layers - Layer Effects - Type Tool: Changing the Type Settings - Type Masking

UNIT V: FLASH

(9 Hours)

Introduction to Flash - Flash Interface: Stage - Timeline - Library - Drawings and Symbols - Flash Project Properties - Timeline and Frames - Animation: Frame by Frame Animation - Tween Animation

Books for Study

1. C. Xavier, Web Technology and Design, 2007, Blue Age International Publishers.
2. Schrand Richard, *Photoshop 6 visual Jumpstart*, 2000, Adobe Press.
3. Mohles L. James, *Flash 5.0 Graphics, Animation & Interaction*, Macromedia, 2000, World Press.

Books for Reference

1. Deitel, *Internet and World Wide Web How to Program*, Third Edition, 2003, Prentice Hall.
2. Reinhardt Robert, Lentz Warren Jon, *Flash 5 Bible*, 2001, Hungry Minds Inc.
3. Meenakshi G M, *Web Graphics*, 2007, SCITECH Publication.

Web References

1. <https://www.geeksforgeeks.org/html-basics>
2. <https://www.educba.com/adobe-photoshop-tools>
3. <https://www.photoshopessentials.com/basics>
4. www.tutorialboneyard.com/simple-flash-animation/
5. <https://www.instructables.com/Flash-Animation-Basics>

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes:

On Successful completion of the course the students able to

CO1: Understanding the HTML concepts. (K2)

CO2: Apply HTML tags to create static web pages including links and frames. (K6)

CO3: Analyze to work on image files using various Photoshop tools. (K4)

CO4: Apply various color effect for image manipulation (K3).

CO5: Understand the concepts of timeline motion to create simple Animation. (K4)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO2	3	3	-	-	1	2	2	-	3	2	2	2	2	22
CO3	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO4	3	3	-	-	1	3	2	-	3	1	2	2	2	22
CO5	3	3	-	-	1	3	1	-	2	1	2	1	1	18
Grand total of COs with PSOs and POs														106
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(106/50)														2.12

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.12
Observation	COs of Web Designing – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE
OPEN SOURCE TECHNOLOGY

Class : B. Sc. (Comp. Sci.)

Part : III SBE-2

Semester : IV

Hours : 45 Hours

Subject Code : 22UCSS24

Credits : 02

Objectives:

The course enables the students to

- Understand the basics of Open Source Technology
- Understand the Open-Source Principles and Methodology
- Understand the structure of Linux OS and Implement the installation of Linux
- Apply Linux commands for basic operations, folder navigation and editing files
- Work with Directories and Files in Linux

UNIT-I

9 Hours

Introduction to Open-Source: Open Source, Need and Principles of OSS, Open-Source Standards, Requirements for Software, OSS success, Free Software, Examples, Licensing, Free Vs. Proprietary Software, Free Software Vs. Open-Source Software, Public Domain. History of free software, Proprietary Vs Open-Source Licensing Model, use of Open- Source Software, FOSS does not mean no cost. History: BSD, The Free Software Foundation and the GNU Project.

UNIT-II

9 Hours

Open-Source Principles and Methodology: Open-Source History, Open- Source Initiatives, Open Standards Principles, Methodologies, Philosophy, Software freedom, Open-Source Software Development, Licenses, Copyright vs. Copy left, Patents, Zero marginal cost, Income-generation Opportunities, Internationalization.

UNIT-III

9 Hours

Introduction to Linux - Distributions - Open Source - The Linux Shell - Root - Capitalization - Installing Linux Server Edition - Installing Linux Desktop Version

UNIT-IV

9 Hours

Basic Linux Tasks/Commands - Sudo - Man Pages - Taskset - Apt-get - Services - Top Basic Linux Navigation - Editing Linux Files with Vim - Starting Vim - Changing File Ownership - Editing and Navigating - Exiting and Saving

UNIT-V

9 Hours

Advanced Linux Navigation - Changing Directories and Finding Files - Listing/Displaying Files Making, Deleting, Moving, Copying, Renaming - Mounting Drives

Books for Study:

1. Kailash Vadera & Bhavyesh Gandhi, Open-Source Technology , First Edition 2009, University Science Press, Laxmi Publications.
2. Adam Vardy, Linux for Beginners The Ultimate Guide to the Linux Operating System & Linux Commands, First Edition, 2016.

Books for References:

1. Clay Shirky and Michael Cusumano, Perspectives on Free and Open-Source Software", MIT press.

2. Andrew M. St. Laurent, Understanding Open Source and Free Software Licensing, , O'Reilly Media.
3. Dan Woods, Gautam Guliani, Open Source for the Enterpris, O'Reilly Media

Web References

1. Linux Basics: <https://nptel.ac.in/courses/117106113>
2. Linux kernel Home: <http://kernel.org4>
3. Open-Source Initiative: <https://opensource.org/5>
4. The Linux Foundation: <http://www.linuxfoundation.org/>

Teaching Methods:

- Lectures
- Group Discussions
- PPTs
- Hands on Training
- Projects work

Course Outcomes:

On the successful completion of the course students will able to

CO1: Explore the basics of open source (K2)

CO2: Understand the Open source principles and methodologies. (K2)

CO3: Explore the Linux Structure and install the Linux OS (K3)

CO4: Apply basic commands of Linux, navigation and editing Linux file. (K3)

CO5: Apply the directory commands in Linux (K5)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO2	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO3	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO4	3	3	-	-	2	3	2	2	3	2	3	3	3	29
CO5	3	3	-	-	2	3	2	2	3	2	3	3	3	29
Grand total of COs with PSOs and POs														145
Mean Value of COs with PSOs and POs =Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(145/55)														2.63

Strong - 3, Medium - 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.63
Observation	COs of Open Source Technologies – Strongly related with PSOs and POs		

ARUL ANANDAR COLEGE (AUTONOMOUS), KARUMATHUR - 625514
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : B.Sc. (Comp. Sci.)

Semester : IV

Subject Code : 22UCSSL4

Part : Self Learning Course

Hours :

Credits : 03

TALLY

Objectives:

The course enables the students to

- Maintain the Company information using Computer Software.
- Maintain Accounting information digitally.
- Understand the method of operating Accounting packages effectively
- Create company, enter accounting voucher entries including advance voucher entries, do reconcile bank statement, do accrual adjustments
- Create receipt, purchase, sales, delivery, and inventory allocations. Reports of inventory

UNIT I

Company information-create company- gate way of Tally- Buttons- primary choices alteration, execution, delegation display.

UNIT II

Accounting information — creation of groups (single and multiple groups) – creation of ledger (single and multiple) –display ledger accounts – cost categories (single and multiple) Cost centres (single and multiple).

UNIT III

Voucher types ; creation of voucher – voucher entry; configuration accounts vouchers – inventory vouchers –common information - voucher types; contra, payment, receipt, journal, credit note, debit note, sales voucher invoice entry basic options, export options, order despatch, purchase voucher, memorandum voucher, bill wise adjustment vouchers – features; accounting, inventory and configure numeric symbols – accounts master – inventory master.

UNIT IV

Inventory information; stock groups (single and multiple) – stock categories (single and multiple) – Stock items (single and multiple) – display, alter, deletion. Godowns; creation of godowns (single and multiple) – unit of measures (single and compound) – display, alter, deletion.

UNIT V

Inventory allocation in voucher entry – Creation of VAT & IT list of tracking numbers, receipt, purchase, sales, delivery, and inventory allocations. Reports; accounting reports, accounts book, statement of accounts, cash flow and fund flow, inventory – Statement of inventory reports – Printing reports.

Book for Study

1. Nandhni.A. K., *Implementing Tally-9*, COP publications, New Delhi.

Books for Reference

1. Dr. Agrawal Namrata. *Tally 9*, Dreamtech Press, New Delhi.
2. S.Palanivel, *Tally Accounting Software*, Margham Publications, Chennai.

Course Outcomes:

On Successful completion of the course the students able to

- Understand the method to maintain Company information digitally (K2)
- Apply the methods to maintain accounts using Computer Software (K3)
- Understand the methods of operating Accounting packages effectively (K2)
- Create company, enter accounting voucher entries including advance voucher entries, do reconcile bank statement, do accrual adjustments (K3)
- Create receipt, purchase, sales, delivery, and inventory allocations. Reports of inventory (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	1	-	-	2	1	1	-	1	1	1	2	2	15
CO2	3	3	-	-	2	2	1	-	2	2	1	1	2	19
CO3	3	3	-	-	2	2	2	-	2	2	2	2	2	22
CO4	3	2	-	-	2	2	2	-	1	2	2	3	3	22
CO5	3	2	-	-	2	2	2	-	1	2	2	3	3	22
Grand total of COs with PSOs and POs														100
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(100/50)														2.0

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs		2.0	
Observation	COs of Tally – Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR.
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS*
(Outcome Based Syllabus under CBCS Structure for the students admitted from the
Academic Year 2019 -2020)

Part	Subject Code	Title of the paper	Hours	Credits
SEMESTER – V				
III	19UCSC95	Core – 9 Computer Graphics	05	05
	19UCSD05	Core – 10 Mobile Computing	04	04
	19UCSD15	Core – 11 Dot NET Programming	05	05
	19UCSP55	Core Lab – 5 Dot NET Programming - Lab	05	03
	19UCSD25	Core – 12 Network Security and Cryptography	05	03
	19UCSD35	Core – 13 Mini - Project	01	01
	19UCSE15	Core Elective – 1 Operation Research	04	03
IV	19USSI16	Soft Skills	01	
		Total	30	24
SEMESTER – VI				
III	19UCSD46	Core – 14 Software Engineering	06	05
	19UCSD56	Core – 15 Data Mining and Ware Housing	05	05
	19UCSD66	Core – 16 Mobile Application Development	06	05
	19UCSP66	Core Lab – 6 Mobile Application Development - Lab	05	03
	19UCSD76	Core – 17 Project – Internship	3	03
	19UCSE26	Core Elective – 2 Open Source Technology	04	02
IV	19USSI16	Soft Skills	01	02
		Total	30	25

Credits for each Semester

Semester	I	II	III	IV	V	VI	Total
Credits	24	25	22	24	24	25	144

* **144 credits from 2017-18 onwards**

Self-Learning Courses

S.No	Semester	Sub. Code	Title of the Paper	Credits
1.	III	19UCSSL3	E-Commerce Technology	3
2.	IV	19UCSSL4	Tally	3
3.	V	19UCSSL5	Enterprise Resource Management	3
4.	VI	19UCSSL6	Software Project Management	3

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF COMPUTER SCIENCE

(Outcome Based Syllabus under CBCS Structure for the students admitted from the Academic Year 2019 -2020)

Program Specific Outcome (PSO)

On successful completion of B.Sc Computer Science Programme, the students will be able to

PSO1: Apply fundamental principles and methods of Computer Science for analysing, designing, developing and testing the software solutions and products with creativity and sustainability

PSO2: Apply modern computing tools, skills and techniques necessary for critical problem solving and analyzing industrial and societal requirements

PSO3: Work as a member or leader in diverse teams in multidisciplinary environment.

PSO4: Employ modern computer languages, environments, and platforms for lifelong learning and a zest for higher studies

PSO5: Provide innovative approaches for solving problems in different domain.

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : B. Sc. (Comp. Sci.)
Semester : V
Subject Code : 19UCSC95

Part : III Core - 9
Hours : 75 Hours
Credits : 05

COMPUTER GRAPHICS

Objectives:

The course enables the students to

- Understand the graphics system and output primitive algorithms
- Apply 2D transformation techniques and clipping operations
- Understand the 3D Objects and curves.
- Apply 3D transformation techniques
- Understand properties of light and color models.

UNIT I

15 Hours

Output Primitives: Points and Lines-Line-Drawing algorithms>Loading frame Buffer-Line function-Circle-Generation algorithms – Ellipse generating algorithms, Attributes of Output Primitives: Line Attributes-Curve attributes-Colour and Grayscale Levels-Area-fill attributes - Character Attributes.

UNIT II

15 Hours

2D Geometric Transformations: Basic Transformations-Matrix Representation-Composite Transformations-Other Transformations. 2D Viewing: The Viewing Pipeline- Viewing Co-ordinate Reference Frame-Window-to-Viewport Co-ordinate Transformation-2D Viewing Functions-Clipping Operations-Point, Line, Polygon, Curve, Text and Exterior clippings.

UNIT III

15 Hours

3D Concepts: 3D Object Representations: Polygon Surface-Curved lines and Surfaces-Super quadrics-Blobby Objects- Spline representation.

UNIT IV

15 Hours

3D Geometric Modelling and Transformations: Translation-Rotation -Scaling -Other Transformations - CompositeTransformations-3D Transformation functions.

UNIT V

15 Hours

Illumination Models: Properties of Light-Standard Chromaticity Diagram- Intuitive color concepts-RGBColor Model-CMYColor Model- HSVColor model - Conversion between HSV and RGB models- Color selection ad Applications.

Book for Study

1. Hearn Donald J, Baker Pauline M, Carithers Warren, *Computer Graphics with Open GL*,Fourth Edition, Pearson New International Edition,2014,.

Books for Reference

1. Donald D Hear, M Pauline Baker, *Computer Graphics*, Second Edition, Pearson Edition, 2011,
2. Newman M. William, Sproull F. Robert, *Principles of Interactive Computer Graphics*, McGraw - Hill, 2016.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes

On successful completion of the course students will be able to

CO1: Apply the output primitive algorithms to draw shapes application. (K3)

CO2: Apply the techniques of 2D operations and clipping to develop image synthesis applications. (K3)

CO3: Understand the 3D object representation and curve and surfaces. (K2)

CO4: Apply 3D clipping algorithms to photo synthesis applications (K3)

CO5: Understand the color models and its applications (K2)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & Pos
CO1	3	3	-	-	3	2	3	-	3	3	3	2	2	27
CO2	3	3	-	-	3	2	3	-	3	3	3	2	2	27
CO3	3	3	-	-	3	2	3	-	3	3	3	2	2	27
CO4	3	3	-	-	3	2	3	-	3	3	2	2	2	26
CO5	3	3	-	-	-	3	2	-	-	2	3	3	3	22
Grand total of COs with PSOs and POs														129
Mean Value of COs with PSOs and POs = Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs = (129/48)														2.69

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.69
Observation	COs of Computer Graphics – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR - 625514

DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Semester : V

Subject Code : 19UCSD05

Part : III – Core-10

Hours : 60 Hours

Credits : 04

MOBILE COMPUTING

Objectives:

The course enables the students to

- Understand the fundamentals of the concepts and principles of mobile computing
- Analyze both theoretical and practical issues of mobile computing
- Develop solutions and building software for mobile computing applications
- Recognize the concept of Wireless Transmission
- Understand the concepts of Mobile Network Layer

UNIT – I

18 Hours

Introduction: Applications – A Simplified Reference Model. Wireless Transmission: Cellular System. Medium Access Control: Motivation for a Specialized MAC: Hidden and exposed terminals – Near and far terminals – SDMA – FDMA – TDMA: Fixed TDM – Classical Aloha – Slotted Aloha – Carrier Sense Multiple Access – Demand assigned Multiple Access – PRMA Packet Reservation Multiple Access – Reservation TDMA – Multiple Access with Collision Avoidance – Polling – Inhibit Sense Multiple Access. CDMA: Spread Aloha multiple access.

UNIT – II

18 Hours

Telecommunication Systems: GSM: Mobile Services – System Architecture – Radio Interface – Protocols - Localization And Calling – Handover – Security – New Data Services. DECT: System Architecture – Protocol Architecture - TETRA.

Unit – III

18 Hours

UMTS and IMT 2000: UMTS Releases and Standardization – UMTS System Architecture - UMTS Radio Interface – UTRAN – Core Network – Handover. Satellite System: History – Applications – Basics: GEO – LEO – MEO .Routing – Localization – Handover. Broadcast Systems: Overview – Cyclical Repetition Of Data – Digital Audio Broadcasting – Digital Video Broadcasting – Convergence of Broadcasting and Mobile Communication.

UNIT – IV

18 Hours

Wireless LAN: Infra-Red Vs. Radio Transmission – Infrastructure and Ad-Hoc Network – IEEE 802.11: System Architecture – Protocol Architecture – Physical Layer – Medium Access Control Layer – MAC Management – HIPERLAN: HIPERLAN1 -WATM – BRAN– HiperLAN2. Bluetooth: User scenarios – Architecture – Radio layer – Base band layer – Link manager protocol.

UNIT – V

18 Hours

Mobile Network Layer: Mobile IP – Dynamic Host Configuration Protocol – Mobile AdHoc Networks. Mobile Transport Layer: Traditional TCP-Classical TCP Improvement-TCP Over 2.5/3G Wireless Networks – Performance Enhancing Proxies.

Book for Study

1. Schiller Jochen, *Mobile Communications*, Second Edition, Pearson Education, 2008

Books for Reference

1. Mallick Martyn, *Mobile and Wireless Design Essentials*, Wiley Publishing, 2003

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

Course Outcomes

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

CO1: Understand and identify the GSM, GPRS, TDMA and CDMA for mobile computing. (K2)

CO2: Develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts. (K6)

CO3: Understanding of the characteristics and limitations of broadcasting system including their user- interface modalities (K2)

CO4: Analyse over wire, wireless channels and Bluetooth system (K4)

CO5: Create and build software for mobile computing applications (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO2	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO3	3	2	-	-	3	2	2	-	3	1	3	2	3	24
CO4	2	3	-	-	3	2	2	-	3	1	3	2	3	24
CO5	2	2	-	-	3	2	2	-	3	1	3	2	3	23
Grand total of COs with PSOs and Pos														119
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(119/50)														2.38

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.38
Observation	COs of Mobile Computing – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : B. Sc. (Comp. Sci.)
Semester : V
Subject Code : 19UCSD15

Part : III – Core-11
Hours : 75 Hours
Credits : 05

DOT NET PROGRAMMING

Objectives:

The course enables the students to

- Understand the HTML, CSS and ASP.NET Architecture.
- Build simple ASP.NET web applications.
- Apply server side controls to create webpage.
- Apply cookies and state management in web page.
- Apply ADO.Net to create dynamic web page.

UNIT-I

15 Hours

Introducing .NET: The Evolution of Web Development – HTML and HTML Forms, Server-Side Programming, Client-Side Programming - The .NET Framework- C#, and the .NET Languages, The Common Language Runtime, The .NET Class Library - The C# Language: C# Language Basics – Variables and Data Types – Variable Operations – Object-Based Manipulation - Conditional Logic – Loops –Methods.

UNIT-II

15 Hours

Types, Objects, and Namespaces: The Basics About Classes – Static Members, A Simple Class. Building a Basic Class – Creating an Object, Adding Properties, Automatic Properties, Adding a Method, Adding a Constructor, Adding an Event. Value Types and Reference Types – Understanding Namespaces and Assemblies – Advanced Class Programming. **Developing ASP.NET Applications:** The Promise of Visual Studio – Creating Websites – Designing a Web Page – The Anatomy of a Web Form – Writing Code – Visual Studio Debugging.

UNIT-III

15 Hours

Web Form Fundamentals: The Anatomy of an ASP.NET Application – Introducing Server Controls – HTML Server Controls, Converting an HTML Page to an ASP.NET Page, View State, The HTML Control Classes, Event Handling, Error Handling. The Page Class – Application Events – ASP.NET Configuration. **Web Controls:** Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple WebPage.

UNIT-IV

15 Hours

Error Handling: Exception Handling – Handling Exceptions. **State Management:** The Problem of State – View State – Transferring Information Between Pages – Cookies – Session State – Session State Configuration – Application State. **Validation:** Understanding Validation – The Validation Controls. **Rich Controls:** The Calendar – The AdRotator – Pages with MultipleViews.

UNIT-V**15 Hours**

ADO.NET Fundamentals: Understanding Databases – Configuring Your Database –SQL Basics – The Data Provider – Model Direct Data Access – Disconnected Data Access.**The Data Controls:** The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – The DetailsViewandFormView.

Book for Study

1. Matthew, MacDonald, *Beginning ASP.NET in C# 2010*, Apress, 2013.

Books for Reference

1. Dr. Sathiaselvan J.G.R., Sasikaladevi .N, *Programming with c#.Net*, Pearson Education Inc, 2009.
2. Matthew MacDonald, Freeman Adam, *Pro ASP.NET 4 in C# 2010*, Apress, 2010.
3. Walther Stephen, Hoffman Kevin and Dudek Nate, *ASP.NET4 Unleashed*, Pearson Education Inc, 2011.
4. Hume Alan Dean, *Fast ASP.NET Websites*, Manning Publications Co, 2013.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes

On successful completion of the course students will be able to

CO1: Apply HTML, CSS in web forms to create a simple application. (K3)

CO2: Apply C# concepts to create a solution in asp.net application. (K3)

CO3: Build web application using web server controls.(K6)

CO4: Apply state management and cookies (K3)

CO5: Apply database connectivity to build web solutions. (K3).

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & Pos
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30

Grand total of COs with PSOs and POs	147
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(147/50)	2.94

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Dot Net Programming – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : B. Sc. (Comp. Sci.)
Semester : V
Subject Code : 19UCSP55

Part : III Core Lab-5
Hours : 75 Hours
Credits: 03

DOT NET PROGRAMMING LAB

Objectives:

The course enables the students to

- Create applications with HTML, CSS and ASP.NET Web controls.
- Develop programs with server controls and validation controls.
- Create applications with ADO.NET data controls.
- Apply data sources and working with data controls.

Create applications with Repeat layout property and directory property.

1. Write a program to display the following feedback form. The different options for the list box must be ASP-XML, DotNET, JavaPro and Unix,C, C++. Submit Form button is clicked after entering the data.
2. Write a program that displays a button in green color and it should change into yellow when the mouse moves over it.
3. Write a program containing the following controls: • A ListBox • A Button • An Image • A Label. The listbox is used to list the items available in a store. When the user clicks on an item in the listbox, its image is displayed in the image control. When the user clicks the button, the cost of the selected item is displayed in the control.
4. Extend the above program to add the following controls: • two labels • A TextBox • A Button One of the labels is displayed adjacent to the textbox, displaying the message “Enter the quantity:” When the user enters the quantity in the textbox and clicks the button, the total cost is evaluated and displayed in another label.
5. Write a program to get a user input such as the boiling point of water and test it to the appropriate value using CompareValidator.
6. Write a program that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button validates the values entered.
7. Create a RadioButtonList that displays the names of some flowers in two columns. Bind a label to the RadioButtonList so that when the user selects an option from the list and clicks on a button, the label displays the flower selected by the user.
8. Create table Employee in master database with the following columns and data types. Dept. Numeric Name Varchar(20) Doj Datetime Sal Float Design Varchar(20) Write a program to connect to the master database in SQL Server, in the Page Load event. When the connection is established, the message “Connection has been established” should be displayed in a label in the form.

9. Select names from the employee table. Retrieve the result in a Dataset. Bind the Dataset to a RadioButtonList and display the result in three different forms as follows: The RepeatDirection property of the RadioButtonList is set to horizontal and its RepeatLayout property is set to Table.ii) The RepeatDirection property of the RadioButtonList is set to Vertical and its RepeatLayoutproperty is set to Table.iii) The RepeatLayout property of the RadioButtonList is set to flow.
10. Write a program to display the records and sorting of database.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learning by Doing
- Video tutorials

Course Outcomes

On successful completion of the course students will be able to

CO1: Develop applications with effective web programming (K6)

CO2: Create applications with web controls in ASP.NET (K6)

CO3: Create a Data Base application using ADO.NET Classes. (K6)

CO4: Create solutions using data controls to display table records in web forms. (K6)

CO5: Develop projects using ASP.NET framework (K6).

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	3	3	3	-	3	3	3	3	3	30
CO2	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO3	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO4	3	3	-	-	3	2	3	-	3	3	3	3	3	29
CO5	3	3	-	-	3	3	3	-	3	3	3	3	3	30
Grand total of COs with PSOs and POs														147
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(147/50)														2.94

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.94
Observation	COs of Dot Net Programming Lab – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR

DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Part : III – Core-12

Semester : V

Hours : 75 Hours

Subject Code : 19UCSD25

Credits : 03

NETWORK SECURITY AND CRYPTOGRAPHY

Objectives:

The course enables the students to

- Understand the fundamental needs of Secure System Design
- Analyze critically about key concept and Techniques
- Understand the overview of the Algorithms
- Compare the Symmetric, Asymmetric and RSA Algorithm
- Identify and mitigate the various Internet Security Protocols.

UNIT I

15 Hours

Introduction to the Concept of Security: Introduction, the Need of Security, Security Approaches, Principal of Security, Types of Attacks

UNIT - II

15 Hours

Cryptographic Techniques: Introduction, Plain Text and Cipher Text, Substitution Techniques, Transposition Techniques, Encryption and decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks

UNIT – III

15 Hours

Computer-based Symmetric Key Cryptographic Algorithms: Introduction, Algorithm Types and Models, An Overview of Symmetric Key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC5, Blowfish, Advanced Encryption Standard (AES), Differential and Linear Cryptanalysis

UNIT – IV

15 Hours

Computer-based Asymmetric Key Cryptographic Algorithms: Introduction, Brief History of Asymmetric Key Cryptography, An Overview of Asymmetric Key Cryptography, The RSA Algorithm, Symmetric and Asymmetric Key Cryptography Together, Digital Signatures.

Unit- V

15 Hours

Network Security: Brief Introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN), **Internet Security Protocols:** Basic Concepts, Security Socket Layer (SSL), Secure Hyper Text Transfer Protocol (SHTTP), Time stamping Protocol (TSP), Secure Electronic Transaction (SET)

Book for Study

1. Kahate Atul, *Cryptography and Network Security*, Third Edition, Tata McGraw Hill Publication, New Delhi, 2006

Book for Reference

1. Forouzan Behrouz A., Mukhopadhyay Debdeep, *Cryptography & Network Security*, Second Edition, McGraw Hill, New Delhi, 2010.
2. Stallings William, *Cryptography and Network Security: Principles and Practices*, Seventh Edition, Prentice Hall, 2014.

Teaching Methods

- Lecturing
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

Course Outcomes

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

CO1: Understand Cryptography and Network Security concepts and applications. (K2)

CO2: Demonstrate and APPLY the process of Basic Concepts of Secure system design. (K3)

CO3: Identify and Analyse Network and Security Threat. (K4)

CO4: Understand the concepts of Asymmetric key cryptography (K2)

CO5: Evaluate the various Network Security protocols (K5)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs&Pos
CO1	3	2	-	-	3	2	2	-	2	2	1	2	3	22
CO2	3	2	-	-	1	2	2	-	3	2	1	2	2	20
CO3	3	2	-	-	1	2	2	-	2	2	1	2	3	20
CO4	2	3	-	-	1	2	2	-	2	2	1	2	2	19
CO5	2	2	-	-	2	1	2	-	2	2	-	2	3	18
Grand total of COs with PSOs and POs														99
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(99/49)														2.05

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.05
Observation	COs of Network Security and Cryptography – Medium related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Mini-Project

Class : B. Sc.(Computer Science)

Part : III Core-13

Semester : V

Hours : 15 Hours

Subject Code : 19UCSD35

Credits : 01

Objectives:

The course enables the students to

- Evolve the problem
- Analyze the requirements
- Design the software model
- Configured and Test the Project.
- Implement the project

Guidelines

- All the students are expected to choose project in IT Related Company/Industry/real project in schools/College/any authorized organization/Institutions.
- Each student will be allocated guide/supervisor by the department for smooth/best way to complete the project.
- The detailed report of the Mini Project must be submitted to the department duly signed by guide/supervisor and Head of the Department.

Examination/ Evaluations

The report will be evaluated by the internal examiner and the candidate also will be evaluated based on viva-voce and presentation of the report and will be graded as shown below.

Excellent	85% and above
Very Good	75% and above but below 85%
Good	60% and above but below 75%
Satisfactory	50% and above but below 60%
Rejected	Less than 50%

Course Outcomes (CO):

On successful completion of the course students will be able to

CO1: Identify and plan the real problem of the Project. (K2)

CO2: Analyze the requirements of problem(K4)

CO3: Design the software model and codifying the project. (K3)

CO4: Test and Implement the Project.(K5)

CO5: Create the Project.(K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	2	3	1	3	1	-	3	3	2	3	3	29
CO2	3	2	2	3	2	3	1	-	3	3	2	3	3	30
CO3	3	2	3	3	2	3	1	-	3	3	2	3	2	30
CO4	2	3	3	2	2	3	1	-	2	2	2	2	3	27
CO5	3	3	3	3	2	2	1	-	3	3	2	3	2	30
Grand total of COs with PSOs and POs														146
Mean value of COs with PSOs and POs = $\frac{\text{Grand total with PSOs and POs}}{\text{Number of COs relating with PSOs\& POs}} = (146/60)$														2.43

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.43
Observation	COs of Mini- Project – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR - 625514
DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Part : III Core Elective - I

Semester : V

Hours : 60 Hours

Subject Code : 19UCSE15

Credits : 03

OPERATIONS RESEARCH

Objectives:

The course enables the students to

- Understand the Linear programming concepts.
- Analyse various Transportation problems.
- Solve mathematical formulation of assignment models.
- Find solutions for various Critical Path method.
- Describe Queuing models.

UNIT I

12 Hours

Linear Programming Models: Mathematical formulation – graphical Solution of linear programming models –Simplex Method-Artificial Variable Techniques-Variants of Simplex method

UNIT II

12 Hours

Transportation and Mathematical formulation of transportation problem - methods for finding initial basic feasible solution – optimum solution - degeneracy.

UNIT III

12 Hours

Mathematical formulation of assignment models –Hungarian Algorithm-Variants of the Assignment problems - Integer Programming Models formulation.

UNIT IV

12 Hours

Scheduling by PERT and CPM Network Construction – Critical Path Method – Project Evaluation and Review Technique-Resource Analysis in Network Scheduling

UNIT V

12 Hours

Queuing Models: Characteristics of Queuing Models - Poison Queues-(M/M/C):(FIFO/),(M/M/C): (FIFO/),(M/M/1):(FIFO/):(M/M/2):(FIFO/) models.

Book for Study

1. Taha H.A, *Operations Research: An Introduction*, Seventh Edition, Pearson Education, 2004.

Books for Reference

1. Natrajan A.M, Balasubramani.P, Tamilarasi. A, *Operations Research*, Person Education, 2005.
2. Rath Rani Rina, *Operations Research*, First Edition, 2019.

Teaching Methods:

- Lecturing
- PPTs and PDF
- Video Tutorials

Course Outcomes:

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

CO1:Evaluate various linear programming concepts. (K5)

CO2: Apply methods to get feasible solution. (K3)

CO3:Analyse various format of Assignment problems. (K4)

CO4: Evaluate Critical Path. (K5)

CO5: Understand queuing process. (K2)

K1=Remember K2=Understand K3=Apply K4=Analyze K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	2	2	-	-	3	3	3	2	2	3	1	3	-	24
CO2	2	3	-	-	3	3	3	3	2	3	1	3	-	26
CO3	1	2	-	-	2	2	2	1	2	3	1	2	-	18
CO4	2	3	-	-	3	3	3	3	2	3	1	3	-	26
CO5	2	2	-	-	3	2	2	2	2	2	1	2	-	20
Grand total of COs with PSOs and Pos														114
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(114/50)														2.28

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and Pos			2.28
Observation	COs of Operation Research – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE

Class : B.sc (Comp.Sci)
Semester : V
Subject code : 19UCSSL5

Part : Self Learning Course
Hours :
Credit : 03

ENTERPRISE RESOURCE MANAGEMENT

Objectives

- Comprehend the technical aspects of ERP systems
- Understand concepts of ERP system implementations
- Map business processes using process mapping techniques
- Understand the steps and activities in the ERP life cycle
- Identify and describe typical functionality in an ERP system

UNIT 1:

Integrated Management Information Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering – Principle of Business Engineering – Business Engineering with Information Technology.

UNIT 2:

Building the Business Model – ERP Implementation – An Overview – Role of consultant, Vendors and Users, Customization – Precautions – ERP Post Implementation Options – ERP Implementation Technology – Guidelines for ERP Implementation.

UNIT 3:

ERP domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP – Market Dynamics and Dynamic Strategy,

UNIT 4:

Description – Multi Server Solution – Open Technology – User Interface – Application Integration.

UNIT 5:

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface.

Book for Study

1. Garg Kumar Vinod, Krishnan Venkita, *Enterprise Resource Planning – Concepts and Practice*, PHI, 1998.

Book for Reference

1. Fernandez Antonio Jose, *The SAP R/3 Handbook*, TMH, 1998.

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of COs with PSOs& POs
Outcome														
CO1	3	2	-	-	1	3	3	-	2	2	2	1	-	19
CO2	2	2	-	-	1	3	3	-	2	2	2	2	-	19
CO3	3	2	-	-	2	3	3	-	2	2	2	2	-	21
CO4	3	3	-	-	2	3	3	-	2	2	2	2	-	22
CO5	3	2	-	-	2	3	3	-	2	2	2	2	-	21
Grand Total of Cos with Pos PSOs														102
Grand total with PSOs and POSs Mean value of Cos with PSO and POs = $\frac{\text{Grand total with PSOs and POSs}}{\text{Number of Cos relating with PSOs\& POs}} = (102 / 45)$														2.26

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.26
Observation	COs of Enterprise Resource Management – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Part : III – Core-14

Semester : VI

Hours : 90 Hours

Subject Code : 19UCSD46

Credits : 05

SOFTWARE ENGINEERING

Objectives:

The course enables the students to

- Understand the basic software engineering design concepts and principles.
- Analyze various cost estimation techniques.
- Explore formal specification techniques and design concepts.
- Illustrate various design notations and project guidelines.
- Describe verification & validations and managerial techniques.

UNIT I

18 Hours

Introduction to software engineering: Definitions – Size Factors – Quality and productivity factors. Planning a software project: planning the Development process-planning an organizational structure.

UNIT II

18 Hours

Software cost Estimation: Software cost Factors-Software cost Estimation Techniques-Staffing-Level Estimation-Estimating Software Estimation Costs.

UNIT III

18 Hours

Software Requirements Specification: Definition –Formal Specification Techniques. Software Design: Fundamental Design Concepts – Modules and Modularization Criteria.

UNIT IV

18 Hours

Design Notations-Design Techniques. Implementation Issues: Structured Coding Techniques-Coding Style - Standards and Guidelines - Documentation Guidelines- Project proposal guidelines.

UNIT V

18 Hours

Verification and Validation Techniques: Quality Assurance- Walkthroughs and Inspections - Unit Testing and Debugging - System Testing. Software Maintenance: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Configuration Management.

Book for Study

1. Richard Fairley, *Software Engineering Concepts*, Fifth Edition, 2017, TMH.

Books for Reference

1. Sommerville Ian, *Software Engineering*, Tenth Edition, 2018, PHI.
2. Mall Rajib, *Fundamentals of Software Engineering*, Third Edition, 2014, PHI.
3. Schach Stephen, *Software Engineering*, Seventh Edition, 2007, TMH.

Teaching Methods

- Lecturing
- PPTs and PDF
- Case Studies
- Video Tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Understand the basic project design concepts and principles. (K2)

CO2: Apply varies cost estimation techniques in real time projects. (K3)

CO3: Analyze varies formal specification techniques in projects. (K4)

CO4: Prepare the project using proper guidelines and design notations. (K5)

CO5: Generate test cases validation and verifications techniques. (K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	2	2	-	-	2	3	2	1	3	2	3	1	3	24
CO2	2	2	-	-	2	2	1	2	3	3	2	2	3	24
CO3	3	2	-	-	2	3	1	1	3	3	2	2	3	25
CO4	2	2	-	-	1	2	2	-	2	3	2	1	2	19
CO5	2	2	-	-	2	3	2	1	3	2	3	1	3	24
Grand total of COs with PSOs and POs														116
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(116/54)														2.14

Strong – 3, Medium -2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.14
Observation	COs of Software Engineering – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS) - KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Semester : VI

Subject Code : 19UCSD56

Part : III – Core-15

Hours : 75 Hours

Credits : 05

DATA MINING AND WAREHOUSING

Objectives:

The course enables the students to

Understand the basic concepts of data mining techniques and algorithms.

Know about the decision tree and classification rules.

Understand cluster analysis and its types.

Know the web mining and ranking of web pages.

Understand the data warehousing backend processes.

UNIT – I

15 Hours

Introduction: Data mining application – data mining techniques – data mining case studies the future of data mining – data mining software - Association rules mining: Introduction basics-task and a naïve algorithm- Apriori algorithm – improve the efficient of the Apriori algorithm – mining frequent pattern without candidate generation (FP-growth) – performance evaluation of algorithms.

UNIT – II

15 Hours

Classification : Introduction – decision tree – over fitting and pruning - DT rules-- naïve Bayes method- estimation predictive accuracy of classification methods - other evaluation criteria for classification method – classification software

UNIT – III

15 Hours

Cluster analysis: cluster analysis – types of data – computing distances-types of cluster analysis methods - partitioned methods – hierarchical methods – density based methods – dealing with large databases – quality and validity of cluster analysis methods - cluster analysis software.

UNIT – IV

15 Hours

Web data mining: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining – web mining software - Search engines: Search engines functionality- search engines architecture – ranking of web pages.

UNIT – V

15 Hours

Data warehousing: Introduction – Operational data sources- data warehousing - Data warehousing design – Guidelines for data warehousing implementation - Data warehousing metadata - Online analytical processing (OLAP): Introduction – OLAP characteristics of OLAP system – Multidimensional view and data cube - Data cube implementation - Data cube operations OLAP implementation guidelines

Book for Study

1. G.K. Gupta, *Introduction to Data mining with case studies*, Thrid Edition, PHI Learning Pvt. Ltd., New Delhi, 2014.

Books for Reference

1. Pujari Arun K , *Data Mining Techniques*, Universities Press, 2001.
2. Han Jiawei, Kamber Micheline, Pei Jian, *Data Mining Concepts and Techniques*, Third Edition, Morgan Kuffman, 2011.

Teaching Methods

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

Course Outcomes:

On successful completion of the course students will be able to

CO1: Understand the basic concepts of Data Mining Techniques and Algorithms(K2)

CO2: Identify appropriate data mining algorithms to solve real world problems(K3)

CO3: Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining (K4)

CO4: Understand the Web Mining and ranking the web pages. (K2)

CO5: Understand Data Warehouse fundamentals and apply OLAP operations (K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with PO and PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	-	-	2	3	2	1	3	2	3	1	3	25
CO2	3	2	-	-	2	2	1	2	3	3	2	2	3	25
CO3	3	2	-	-	2	3	1	1	3	3	2	2	3	25
CO4	3	2	-	-	1	2	2	-	2	3	2	1	2	20
CO5	3	2	-	-	2	3	2	1	3	2	3	1	3	25
Grand total of COs with PSOs and POs														
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(120/54)														2.22

Strong - 3, Medium - 2, Low –1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.22
Observation	COs of Data Mining and Warehousing – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514

DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Part : III – Core-16

Semester : VI

Hours : 90 Hours

Subject Code : 19UCSD66

Credits: 05

MOBILE APPLICATION DEVELOPMENT

Objectives:

The course enables the students to

- Understand the basic concepts of mobile application frameworks.
- Know about the mobile application development languages.
- Understand the Application models of mobile application frameworks
- Know the User-interface design for mobile applications
- Managing application data using database

Unit I

18 Hours

What is Android, Android versions and its feature set The various Android devices on the market , The Android Market application store , Android Development Environment - System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs)

Unit II

18 Hours

The Android Software Stack, The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, DalvikVM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework, Creating a New Android Project ,Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon, Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files,

Unit III

18 Hours

Understanding Java SE and the Dalvik Virtual Machine , The Directory Structure of an Android Project , Common Default Resources Folders , The Values Folder , Leveraging Android XML, Screen Sizes , Launching Your Application: The AndroidManifest.xml File , Creating Your First Android Application

Unit IV

18 Hours

Designing for Different Android Devices, Views and View Groups, Android Layout Managers, The View Hierarchy, Designing an Android User Interface using the Graphical Layout Tool, Displaying Text with TextView, Retrieving Data from Users, Using Buttons, Check Boxes and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display Data to Users, Adjusting Progress with SeekBar, Working with Menus using views, Displaying Pictures - Gallery, ImageSwitcher, GridView, and ImageView views to display images, Creating Animation

Unit V

18 Hours

Saving and Loading Files, SQLite Databases, Android Database Design, Exposing Access to a Data Source through a Content Provider, Content Provider Registration, Native Content Providers Intents and Intent Filters- Intent Overview, Implicit Intents, Creating the Implicit Intent Example Project, Explicit Intents, Creating the Explicit Intent Example Application, Intents with Activities, Intents with Broadcast Receivers

Books for Study

1. Darcey Lauren, Conder Shane, *Android Wireless Application Development*, Second Edition, Pearson Education
2. Rogers Rick, Lombardo John, Mednieks Zigurd, Meike Blake, *Android Application Development*, O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010

Books for Reference:

1. Meier Reto, *Professional Android 2 Application Development*, Wiley India Pvt Ltd
2. Murphy Mark L, *Beginning Android*, Wiley India Pvt Ltd
3. Hashimi Sayed Y, Komatineni Satya, MacLean Dave, *Pro Android*, Wiley India Pvt Ltd

Teaching Methods

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

Course Outcomes:

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

CO1: Exposed to technology and business trends impacting mobile applications(K1)

CO2: Understand the characterization and architecture of mobile applications (K2)

CO3: Competent with understanding enterprise scale requirements of mobile applications (K2).

CO4: Designing and developing mobile applications using one application development framework (K3)

CO5: Manage data in the application operations and implementations.(K3)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	-	-	3	3	3	1	3	3	3	1	2	28
CO2	3	3	-	-	3	2	3	1	3	3	3	1	2	27
CO3	3	3	-	-	3	2	3	1	3	3	3	1	1	26
CO4	3	3	-	-	3	2	3	1	3	3	3	1	1	26
CO5	3	3	-	-	3	3	3	2	3	3	3	1	2	29
Grand total of COs with PSOs and Pos														136
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(136/55)														2.47

Strong -3 , Medium -2 , Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.47
Observation	COs of Mobile Application Development – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514

DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Part : III Core Lab-6

Semester : VI

Hours : 75 Hours

Subject Code : 19UCSP66

Credits: 03

MOBILE APPLICATION DEVELOPMENT LAB

Objectives:

The course enables the students to

- Acquire knowledge in IDE for mobile emulators and devices
 - Understand variables, class and string in typescript
 - Write efficient program using Views, Layouts Graphics
 - Design and Develop test based mobile applications
 - Write program to manipulate files with database
1. Create “Hello World” application. That will display “Hello World” in the middle of the screen in the red color with white background.
 2. To understand Activity, Intent
 - a. Create sample application with login module.(Check username and password)
 - b. On successful login, go to next screen. And on failing login, alert user using Toast.
 - c. Also pass username to next screen.
 3. Create login application where you will have to validate EmailID (UserName). till the username and password is not validated, login button should remain disabled.
 4. Create and Login application as above. On successful login, open browser with any URL.
 5. Create an application that will pass some number to the next screen, and on the next screen that number of items should be display in the list.
 6. Understand resource folders :
 - a. Create spinner with strings taken from resource folder (res >> value folder).
 - b. On changing spinner value, change image.
 7. Understand Menu option.
 - a. Create an application that will change color of the screen, based on selected options from the menu.
 8. Create an application that will display toast (Message) on specific interval of time.
 9. Create an background application that will open activity on specific time.
 10. Create an application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.
 11. Understanding of UI :
 - a. Create an UI such that, one screen have list of all the types of cars.
 - b. On selecting of any car name, next screen should show Car details like : name, launched

12. date, company name, images(using gallery) if available, show different colors in which it is available.
13. Understanding content providers and permissions:
 - a. Read phonebook contacts using content providers and display in list.
 - b. Read messages from the mobile and display it on the screen.
14. Create an application to call specific entered number by user in the EditText
15. Create an application that will create database with table of User credential.
16. Create an application that will play a media file from the memory card.
17. Create an application to make Insert, update, Delete and retrieve operation on the database.
18. Create an application to read file from the sdcard and display that file content to the screen.
19. Create an application to draw line on the screen as user drag his finger.
20. Create an application to send message between two emulators.

COURSE OUTCOMES

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

CO1: Write simple programs using mobile emulator and devices.(K2)

CO2: Develop test based mobile applications. (K3)

CO3: Create programs using Views, Layouts (K3)

CO4: Apply programming concepts in developing mobile App.(K3)

CO5: Develop programs to manage data in applications (K3)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	3	-	-	2	2	2	-	3	3	1	3	3	25
CO2	3	2	-	-	2	3	2	-	3	2	1	3	3	24
CO3	3	2	-	-	2	3	2	-	3	2	1	3	2	23
CO4	3	2	-	-	2	3	2	-	3	2	1	2	3	23
CO5	3	2	-	-	2	3	2	1	3	2	1	3	2	24
Grand total of COs with PSOs and POs														119
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(119/51)														2.33

Mapping Scale	1	2	3
Relation	0.01to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.33
Observation	COs of Mobile Application Development – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS)-KARUMATHUR
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

Class : B.Sc (Comp.Sci)
Semester : VI
Subject Code : 19UCSD76

Part : Core -17
Hours : 45
Credit : 3

PROJECT WORK/INTERNSHIP

Objectives:

The course enables the students to

CEO1: Understand and Plan the real problem of the Project.

CEO2: Analyze the problem.

CEO3: Design the Project.

CEO4: Implement the Project.

CEO5: Configured and Test the Project.

Guidelines

- All the students are expected to choose project in IT Related Company/Industry/real project in schools/College/any authorized organization/Institutions.
- Each student will be allocated guide/supervisor by the department for smooth/best way to complete the project.
- All the students are expected to submit attendance and company undertaking and project completion certificate during the period of project allotted duration.
- Three copies of the thesis/record note book must be submitted to the department duly signed by guide/supervisor and Head of the Department.

Examination/ Evaluations

The thesis/record notebook will be evaluated by the internal examiner and external examiner who are appointed by the Office of the Controller of Examination. The candidate also will be evaluated based on viva-voce and presentation of the thesis/record notebook and will be graded as shown below.

Excellent	85% and above
Very Good	75% and above but below 85%
Good	60% and above but below 75%
Satisfactory	50% and above but below 60%
Rejected	Less than 50%

Course Outcomes (CO):

On successful completion of the course students will be able to

CO1: Identify and plan the real problem of the Project. (K2)

CO2: Analyze the problem of the Project. (K4)

CO3: Apply and Design the Project. (K3)

CO4: Implement the Project.(K5)

CO5: Create the Project.(K6)

K1=Remember K2=Understand K3=Apply K4=Analysis K5=Evaluate K6=Create

Mapping Course outcome with POs and PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs& POs
CO1	3	2	2	-	1	3	1	-	3	3	2	3	3	26
CO2	3	2	2	-	2	3	1	-	3	3	2	3	3	27
CO3	3	2	3	-	2	3	1	-	3	3	2	3	2	27
CO4	2	3	3	-	2	3	1	-	2	2	2	2	3	25
CO5	3	3	3	-	2	2	1	-	3	3	2	3	2	27
Grand total of COs with PSOs and Pos														132
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(132/55)														2.40

Strong -3, Medium -2, Low -1

Mapping Scale	1	2	3
Relation	0.01to 1.0	.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.40
Observation	COs of Project Work – Strongly related with PSOs and POs		

ARUL ANANDARCOLEGE (AUTONOMOUS), KARUMATHUR – 625514

DEPARTMENT OF COMPUTER SCIENCE

Class : B. Sc. (Comp. Sci.)

Part : III Core Elective-2

Semester : VI

Hours : 60 Hours

Subject Code : 19UCSE26

Credits: 02

OPEN SOURCE TECHNOLOGY

Objectives:

The course enables the students to

- Understand the essentials of PHP.
- Develop applications using PHP strings and arrays.
- Understand how to create functions and control statements.
- Create a web page with various controls and files.
- Apply the data base operations in the web page

UNIT-I

12 Hours

PHP ESSENTIALS: Creating your Development Environment – Mixing HTML and PHP – Command - Line PHP – Working with Variables – Creating Constants – Understanding PHP's Internal Data types – Operators and Flow Control.

UNIT-II

12 Hours

STRINGS AND ARRAYS: String Functions- Converting to and from Strings - Formatting Text String -Modifying Data in an Array-Deleting Array Elements- Arrays with Loops - PHP Array Functions-Sorting Arrays.

UNIT-III

12 Hours

CREATING FUNCTIONS: Passing Functions-Passing Arrays to Functions- Passing by Reference-Using Default Arguments- Returning Data from functions- Nesting Functions- **CONTROL STATEMENTS:** Data Input/Output functions - flow of control-control structures - switch, break and continue - Go to statement-comma operator.

UNIT-IV

12 Hours

READING DATA IN WEB PAGES: Setting up web pages to communication with PHPHandling Text Fields-Checkbox-Radio button-Password Controls- List boxes- Buttons – Hidden Control – File Upload.

UNIT-V

12 Hours

WORKING WITH DATABASES: Creating a MYSQL Database-Creating a New Table - Putting Data into a New Database-Accessing the Databases in PHP-Updating the Database-Inserting New Data Items into a Database- Deleting Records-Creating New Tables-Creating a New Database-Sorting your Data.

Book for Study:

1. Holzner Steven, *The Complete Reference PHP*, First Edition 2007, Tata McGraw Hill Pvt. Ltd.

Books for Reference:

1. Atkinson Leon, Suraski Zeev, *Core PHP programming*, Third Edition, , Prentice Hall, 2003
2. Brasseur, *Forge Your Future with Open Source Build Your Skills*, First Edition, Pragmatic Bookshelf, 2018

Teaching Methods:

- Lectures
- Group Discussions
- PPTs
- Learn by Doing
- Video Tutorials

Course Outcomes:

On the successful completion of the course students will able to

CO1: Analyse the essentials of PHP. (K4)

CO2: Create an array and working with string functions. (K6)

CO3: Develop Applications of control statements in a function. (K3)

CO4: Understand reading data from a web page with different controls. (K2)

CO5: Create databases and work with the databases.(K6)

K1= Remember K2 = Understand K3= Apply K4=Analysis K5= Evaluate K6= Create

Mapping Course outcome with PO and PSO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	Sum of COs with PSOs & POs
CO1	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO2	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO3	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO4	3	3	-	-	2	3	2	2	3	2	3	3	3	30
CO5	3	3	-	-	2	3	2	2	3	2	3	3	3	30
Grand total of COs with PSOs and POs														150
Mean Value of COs with PSOs and POs=Grand total of COs with PSOs and POs / Number of COs relating with PSOs and POs=(150/55)														2.72

Strong - 3, Medium - 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01 to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.72
Observation	COs of Open Source Technologies – Strongly related with PSOs and POs		

ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF COMPUTER SCIENCE

Class	: B.Sc (Comp.Sci)	Part	: Self Learning Course
Semester	: VI	Hours	:
Subject code	: 19UCSSL6	Credit	: 03

SOFTWARE PROJECT MANAGEMENT

Objectives:

On Successful completion of the course the students should have:

- Learnt to acquire a set of skills for planning and implementing a software projects.
- Learn to acquire a set of skills for managing Cost and Time.
- Learn to access the control risk in project management.

UNIT I

What is a project – Traditional Project Management – Scoping the project – identifying Project Activities.

UNIT II

Estimating duration, Resource Requirements and Cost – constructing and analyzing the project Network Diagram – Finalizing the Schedule and Cost Based on Resource Availability – Organizing and conducting the joint project planning session.

UNIT III

Recruiting Organizing and managing the project team – Monitoring and controlling progress – Closing out the projects – Critical Chain Project Management.

UNIT IV

Introduction to Adaptive Project Framework – version scope – Cycle Plan – Cycle Build – Client Checkpoint – Post – Version Review – Variations to APF

UNIT V:

Organizational Considerations – Project Portfolio Management – Project Support Office.

Book for Study

1. Robert K.Wyzocki, RuddMcGary, *Effective Project management*, WILEY – Dreamtech India pvt.Ltd., 2003.

Books for Reference

1. Pressman S. Roger, *Software Engineering A Practitioner's Approach*, Fourth Edition, McGraw Hill International,2000.
2. Somerville Ian, *Software Engineering*, Fifth Edition, Addison Wesley Publications, 1996.
3. Hughes Bob, Cotterell Mike, *Software and Project Management*, Tata McGraw - Hill Publishing Company Limited, Third Edition, 2004.
4. Royce Walker, *Software Project Management*, Addison - Wesley,1998.

Mapping

Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Sum of Cos with PSOs&Pos
Outcome														
CO1	1	1	2	-	-	3	3	-	1	2	2	2	-	17
CO2	2	2	2	-	1	3	3	-	2	2	2	2	-	21
CO3	3	3	2	-	2	3	3	-	1	3	3	3	-	26
CO4	3	2	2	-	1	3	3	-	2	2	3	1	-	22
CO5	3	3	3	-	2	3	3	-	1	2	3	2	-	25
	Grand Total of Cos with POs and PSOs													111
	Grand total with PSOs and POSs Mean value of Cos with PSO and POs = _____ =(111/49) Number of Cos relating with PSOs& POs													2.26

Strong – 3, Medium – 2, Low – 1

Mapping Scale	1	2	3
Relation	0.01to 1.0	1.01 to 2.0	2.01 to 3.0
Quality	Low	Medium	Strong
Mean Value of COs with PSOs and POs			2.26
Observation	COs of Software Project Management – Strongly related with PSOs and POs		