

## **PROGRAMME OUTCOMES (POs)**

**The Undergraduate students of all disciplines will be able to:**

**PO 1:** Develop sharp cognisance of concepts, apply the domain knowledge with utmost confidence and be assertive at any given opportunity.

**PO 2:** Possess deeper understanding of life skills to appraise life and draw logical conclusions.

**PO 3:** Design and develop solutions for challenging problems of society.

**PO 4:** Acquire programme centric thought process facilitating further studies in the respective domain.

**PO 5:** Engage in life-long learning to easily adapt to the dynamic environment and obtain clarity and preparedness for field specialisation.

**PO 6:** Self actualise and self regulate, focussing on ethical and moral values to become a compassionate human being.

**PROGRAMME PROFILE**  
**(Computer Applications)**

**TOTAL CREDITS: 140**

PART	COURSE	TITLE OF THE PAPER	CODE	L	T	H	C
<b>I SEMESTER</b>							
<b>I</b>	Foundation	Tamil –I/Hindi –I/ Sanskrit-I/ French-I	20ULTFC1001/ 20ULHFC1001/ 20ULSFC1001/ 19ULFFC1001	4	2	6	3
<b>II</b>	Foundation	General English -I	20UGEFC1001	4	2	6	3
<b>III</b>	Core I	Programming in C and C++		3	1	4	4
<b>III</b>	Core Practical –I	Programming in C and C++ Lab		2	1	3	2
<b>III</b>	Core Practical –II	Web Designing Lab	20UCACP1002	2	1	3	2
<b>III</b>	Allied I	Allied Mathematics-I	20UCAAT1001	4	2	6	5
<b>IV</b>	Soft Skill I	Soft Skills - Essentials of Communication Skills	20USSLC1001			2	3
<b>II SEMESTER</b>							
<b>I</b>	Foundation	Tamil –II/ Hindi –II/ Sanskrit-II / French-II	20ULTFC2002 20ULHFC2002 20ULSFC2002 19ULFFC2002	4	2	6	3
<b>II</b>	Foundation	General English -II	20UGEFC2002	4	2	6	3
<b>III</b>	Core II	Python Programming		3	1	4	4
<b>III</b>	Core Practical –III	Python Lab		2	1	3	2
<b>III</b>	Core Practical –IV	Major Practical –IV UNIX Lab	20UCACP2004	2	1	3	2
<b>III</b>	Allied II	Allied Mathematics-II	20UCAAT2002	4	2	6	5
<b>IV</b>	Soft Skill II	Soft Skills - Essentials of Spoken and Presentation Skills	20USSLC2002			2	3
<b>IV</b>	Value Education(as Applicable)	Environmental Studies	20UESVE2001				2
<b>IV</b>	Value Education(as Applicable)	Yoga and wellness	20UYGVE2002				2

III SEMESTER							
III	Core III	Programming in Kotlin		3	2	5	4
III	Core IV	Data Structures and algorithms	20UACT3004	3	2	5	4
III	Core V	Computer Architecture	20UACT3005	2	2	4	4
III	Major Practical -V	Kotlin Lab		3	1	4	2
III	Core Practical -VI	Data structures Using C++ Lab	20UCACP3006	3	1	4	2
III	Allied III	Financial Accounting	20UCAAT3003	4	2	6	5
IV	NME I	Introduction to Cyber Security	20UCANE3001			2	2
IV SEMESTER							
III	Core VI	Operating systems	20UACT4006	3	2	5	4
III	Core VII	Data Communication and Networking	20UACT4007	2	2	4	4
III	Core VIII	RDBMS	20UACT4008	3	2	5	4
III	Core Practical -VII	RDBMS Lab	20UCACP4007	3	1	4	2
III	Core Practical -VIII	Accounting software and Data Analytics Lab		3	1	4	2
III	Allied IV	Cost and Management Accounting	20UCAAT4004	4	2	6	5
IV	NME II	Introduction to Cyber Security	20UCANE4002			2	2
V SEMESTER							
III	Core IX	Programming in Java	20UACT5009	3	2	5	4
III	Major X	Programming in PHP and MYSQL	20UACT5010	3	2	5	4
III	Core XI	Software Engineering and Testing	20UACT5011	3	2	5	4
III	Core Practical -IX	Java Programming Lab	20UCACP5009	3	1	4	2
III	Core Practical -X	PHP and MYSQL Lab	20UCACP5010	3	1	4	2
III	Elective I	Choose one from List of Electives		3	2	5	5
	Soft Skill III	Skill Enhancement course	20USSSE5002			2	3
VI SEMESTER							
III	Core XII	Web Technology	20UACT6012	4	2	6	4
III	Core Practical -XI	Web Technology Lab	20UCACP6011	3	2	5	2
III	Core Practical -XII	Node.js Lab		3	2	5	2
III	Elective II	Any one from the list		3	2	5	5
III	Elective III	Mini Project	20UCAPR6001	5	2	7	5
IV	Soft Skill IV	Skill Based Elective	20USSCA6004			2	3

L =LectureHrs; T =TutorialHrs; H = Hrsperweek; C =Credits

**Assessment Model (from 2020 – 21 onwards)**  
**Under graduation programme**  
**40% Internal 60% External**

S.No	Assessment Component	Marks	Weighted %
<b>A.</b>	<b>Theory</b>		
1	<b>INTERNAL ASSESSMENTS</b>		
	Continuous Assessment Test(best two out of three)	2 x 50 = 100	15
2	Quiz/Group Discussion/Seminar/Assignment/Role Play/ Case Study/ Open Book/ snap Test/ Video Presentation/ Review (any three to be considered)	3 x 10 = 30	15
3	MCQ (one test to be conducted online during the semester)	20	05
4	<b>Attendance*</b>	<b>05*</b>	<b>05</b>
5	<b>EXTERNAL ASSESSMENT</b>		
	End semester examinations	75	60
	Grand Total		<b>100</b>
<b>B</b>	<b>Practical</b>		
1	<b>INTERNAL ASSESSMENTS</b>		
	Continuous Assessment Test(best two out of three)	2 x 50 = 100	15
2	Record + Observation	10 +10 = 20	15
3	MCQ (one test to be conducted online during the semester)	20	05
4	<b>Attendance*</b>	<b>5*</b>	<b>05</b>
5	<b>EXTERNAL ASSESSMENT</b>		
	End semester Examinations	60	60
	Grand Total		<b>100</b>

**Attendance\* - awarding marks for attendance (out of 5)**

**Attendance below 60% = 0 marks; 61% to 75% = 3 marks; 76% to 90% = 4 marks; above 91% = 5 marks**

**DEPARTMENT OF COMPUTER APPLICATIONS**  
**SDNB VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)**

**CHENNAI-600044.**

**(Computer Applications)**  
**COURSE FRAME WORK**

**SEMESTER I**

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
I	20ULTFC1001/ 20ULHFC1001/ 20ULSFC1001/ 19ULFFC1001	Foundation	Tamil -I/ Hindi -I/ Sanskrit-I/ French-I	6	3	40	60	100
I	20UGEFC1001	Foundation	English -I	6	3	40	60	100
I	20UCACT1001	Core Paper -I	Programing in C and C++	4	4	40	60	100
I	20UCACP1001	Core Practical-I	Programing in C and C++ Lab	3	2	40	60	100
I	20UCACP1002	Core Practical-II	Web Designing Lab	3	2	40	60	100
I	20UCAAT1001	Allied I	Allied Mathematics-I	6	5	40	60	100
I	20USSLC1001	SoftSkill I	Soft Skills - Essentials of Communication Skills	2	3	50	-	
			<b>TOTAL(Core +Allied)</b>		<b>13</b>			<b>400</b>

**SEMESTER II**

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
II	20ULTFC2002 20ULHFC2002 20ULSFC2002 19ULFFC2002	Foundation	Tamil -II/ Hindi -II/ Sanskrit-II/ French-II	6	3	40	60	100
II	20UGEFC2002	Foundation	English -II	6	3	40	60	100
II	20UCACT2002	Core Paper -II	Python Programming	4	4	40	60	100
II	20UCACP2003	Core Practical-III	Python Lab	3	2	40	60	100

II	20UCACP2004	Core Practical-IV	UNIX Lab	3	2	40	60	100
II	20UCAAT2002	Allied II	Allied Mathematics-II	6	5	40	60	100
II	20USSLC2002	Soft Skill II	Soft Skills - Essentials of Spoken and Presentation Skills	2	3	50	-	
II	20UESVE2001	Value Education(as Applicable)	Environmental Studies		2	50	-	
II	20UYGVE2002	Value Education(as Applicable)	Yoga and Wellness		2	50	-	
			<b>TOTAL(Core +Allied)</b>		<b>13</b>			<b>400</b>

### SEMESTER III

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
III	20UACT3003	Core Paper -III	Programming in kotlin	5	4	40	60	100
III	20UACT3004	Core Paper -IV	Data Structures and algorithms	5	4	40	60	100
III	20UACT3005	Core Paper -V	Computer Architecture	4	4	40	60	100
III	20UCACP3005	Core Practical-V	Kotlin Lab	4	2	40	60	100
III	20UCACP3006	Core Practical-VI	Data structures Using C++ Lab	4	2	40	60	100
III	20UCAAT3003	Allied III	Financial Accounting	6	5	40	60	100
III	20UCANE3001	NME I	Introduction to Cyber Security	2	2	50	-	
			<b>TOTAL(Core +Allied)</b>		<b>21</b>			<b>600</b>

### SEMESTER IV

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
IV	20UACT4006	Core Paper -VI	Operating systems	5	4	40	60	100
IV	20UACT4007	Core Paper -VII	Data Communication and Networking	4	4	40	60	100
IV	20UACT4008	Core Paper -VIII	Relational Database Management System(RDBMS)	5	4	40	60	100
IV	20UCACP4007	Core Practical-VII	RDBMS Lab	4	2	40	60	100
IV		Core Practical-VIII	Accounting software and Data Analytics Lab	4	2	40	60	100
IV	20UCAAT4004	Allied IV	Cost and Management Accounting	6	5	40	60	100
IV	20UCANE4002	NME II	Introduction to Cyber Security	2	2	50	-	
			<b>TOTAL(Core +Allied)</b>		<b>21</b>			<b>600</b>

### SEMESTER V

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
V	20UACT5009	Core Paper -IX	Programming in Java	5	4	40	60	100
V	20UACT5010	Core Paper -X	Programming in PHP and MYSQL	5	4	40	60	100
V	20UACT5011	Core Paper -XI	Software Engineering and Testing	5	4	40	60	100
V	20UCACP5009	Core Practical-IX	Java Programming Lab	4	2	40	60	100
V	20UCACP5010	Core Practical-X	PHP and MYSQL Lab	4	2	40	60	100
V	20UCAET5RM1 20UCAET5IT1 20UCAET5AI1 20UCAET5ST1  20UCAET5CG1 20UCAET5DM1	Elective I	Resource Management Techniques Internet of Things Artificial Intelligence Security in Information Technology Computer Graphics Data Mining	5	5	40	60	100

V	20USSSE5003	Skill Enhancement Course Soft Skill-III	ESRM/VIVAC(Applicable only for B.Com Accounting and Finance, B.Com Professional Accounting)	2	3	50	-	
			<b>TOTAL(Core +Allied)</b>		<b>21</b>			<b>600</b>

**SEMESTER VI**

SEM	COURSE CODE	COURSE TITLE	TITLE OF THE PAPER	HRS	CREDITS	CA	SE	T
VI	20UACT6012	Core Paper - XII	Web Technology	6	4	40	60	100
VI	20UACT6011	Core Practical-X1	Web Technology Lab	5	2	40	60	100
VI	20UCACP6012	Core Practical-XII	Node.js Lab	5	2	40	60	100
VI	20UCAET6RM2 20UCAET6IT2 20UCAET6AI2 20UCAET6ST2  20UCAET6CG2 20UCAET6DM2	Elective II	Resource Management Techniques Internet of Things Artificial Intelligence Security in Information Technology Computer Graphics Data Mining	6	5	40	60	100
VI	20UCAPR6001	Elective III	Mini Project	6	5	40	60	100
VI	20USSCA6004	Skill Based Elective Soft Skill - IV	Skill Based Elective	2	3	50	-	
			<b>TOTAL(Core +Allied)</b>		<b>18</b>			<b>500</b>



### **List of Electives :**

1. Resource Management Techniques
2. Internet of Things
3. Artificial Intelligence
4. Security in Information Technology
5. Computer Graphics
6. Data Mining

### **Skill Enhancement Course & Skill Based Elective (Semester V & VI) :**

1. Latex
2. R Programming
3. Scilab
4. Inkscape
5. GIMP
6. Blender
7. Android App

### **Internship**

Internship in IVth semester summer holidays with 2 credits

## SEMESTER I

### PROGRAMMING IN C AND C++

**TOTAL HOURS: 75**

**CREDIT: 4**

**SUBCODE:**

**L-T-P: 3-1-0**

### COURSE OBJECTIVES

1. This course introduces fundamental concepts such as arrays, structures.
2. It covers concepts such as OOPs, functions and file handling methods.
3. It provides technical skills to design and develop various applications.

**COURSE OUTCOMES:** on completion of the course the students will be able to...

CO No.	CO Statement
CO1	To learn the basic and introduction of computer, structure of C, C++ control structure
CO2	To know arrays, arrays types, string handling functions
CO3	To understand OOPs concepts, debugging and executing the program.
CO4	To understand the functions and constructors and destructors.
CO5	To apply good programming principles to the design and implementation of programs.

### SYLLABUS

#### UNIT I

**15 Hrs**

Introduction of Programming Languages: Types of Languages, Evolution of 'C', Structure of a 'C' Program, Executing and Debugging a 'C' Program, Tokens, Control Statement and Expressions, Looping.

#### UNIT II

**15 Hrs**

Arrays and String: Introduction of Array, Types of Array, String handling Functions, Functions: Concept of Function, User defined Function, System Defined Function, Types of parameter passing in function, Pointers: Types of Pointers, Pointer Expression, Arrays of Pointers, Pointers and Functions, Structure and Unions.

#### UNIT III

**15 Hrs**

Introduction to Object Oriented Programming, Concept of OOP, Features of OOP, Introduction of 'C++', Structure of 'C++' program, Executing and Debugging a 'C++'

Program, 'C++' Tokens and Type Casting.

#### **UNIT IV**

**15 Hrs**

Classes & Objects, Function in 'C++', Friend function, Virtual Functions, Constructors and Destructor, Operator Overloading, Overloading Unary and Binary operators, Overloading using friend function

#### **UNIT V**

**15 Hrs**

Inheritance, Types of inheritance ,Virtual base classes and abstract base classes, Working with files ,File operations, File pointer and their manipulation, Exception Handling.

### **TEXT BOOKS:**

1. Reema Thareja, Programming In C, Oxford University Press.
2. Paul Dietel, Harvey Dietel, "C How to Program", 6th Edition, PHI, 2010.
3. Balagurusamy ,(2008), "Programming in ANSI C " , Fourth Edition -Tata McGraw Hill
4. Reema Thareja, Programming In C++, Oxford University Press.
5. E.Balagurusamy, (2008), "Object Oriented Programming with C++", Seventh Edition - McGraw Hill Publications.

### **BOOKS FOR REFERENCE:**

1. Yeswanth Kanethkar,(2007),"Let Us C", Eighth Edition - BTB Publications.
2. B.A. Forouzan and R.F. Gilberg, "A Structured Programming Approach in C" , Cengage Learning, 2007
- 3.Bjarne Stroustrup, "The C++ Programming Language", 3rd Edition, Pearson Education.
4. Ashok N Kamthane,(2003) -"Object oriented Programming with ANSI and Turbo C++",First Edition -Pearson Education Publication.
- 5.Yashavanth Kanetkar, (2008), "Let us C++", Fourth Edition -BPB Publications.

### **E-LEARNING RESOURCES:**

1. <https://www.tutorialspoint.com/cprogramming/index.htm>
2. <https://www.guru99.com/c-programming-tutorial.html>
3. <https://www.w3schools.in/c++-tutorial>
4. <https://www.programiz.com/c++-programming>
5. <https://www.javatpoint.com/c++-programming-language-tutorial>

### **PEDAGOGY (TEACHING METHODOLOGY):**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

### Mapping of CO with PSO:

<b>CO / PSO</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO1</b>	3	2	2	3	3
<b>CO2</b>	3	2	2	3	3
<b>CO3</b>	3	2	1	2	3
<b>CO4</b>	3	2	2	3	3
<b>CO5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.8	2.8	3

**SEMESTER I**  
**PROGRAMMING IN C and C++ LAB**

**TOTAL HOURS: 60**  
**CREDIT: 2**

**SUB CODE:**  
**L-T-P: 0-0-3**

**COURSE OBJECTIVES**

1. To make the student learn a programming language.
2. To learn problem solving techniques.
3. To teach the student to write programs in C , C++ and to solve the problems.

**COURSE OUTCOMES:** on completion of the course the students will be able to...

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	To Understand the basic concept of C and C++ Programming Structures, and its different modules that includes Conditional and Looping Expressions
<b>CO2</b>	To Identify about the basic concept of writing a program using String manipulations.
<b>CO3</b>	To Apply the Function concepts.
<b>CO4</b>	To Apply the Class and objects.
<b>CO5</b>	To Acquire knowledge about file concepts and Reference variables.

**List of Programs**

**1. Control structures using C**

- .Generate 'n' prime number.
- Factorial of the given number.

**2. String manipulation using C**

- Counting the no. of vowels, consonants, words, white spaces in a line of text
- Reverse a string and check for palindrome.
- Finding and replacing substrings

**3. Functions using C and C++**

- Fibonacci sequence.
- Maximum and Minimum.

**4. Recursion using C and C++**

GCD of two numbers.

Towers of Honai.

**5. Matrix Manipulation Using C**

Transpose of a matrix.

**6. Pointers using C**

Write Insertion sort program using array of pointers.

**7. File Handling in using C**

Copy a text file to another

Create a file of objects and display the objects stored in the file

**8. Polymorphism**

Overload Unary operator

Overload Binary operator

Overload operators using friends

**9. Inheritance**

Illustrate multilevel inheritance

Resolve ambiguity in multiple inheritance (virtual base class)

**10. Virtual and Friend Functions**

Illustrate runtime polymorphism

Illustrate working of a friend function

**11. THIS Pointers using C++**

Illustrate the use of THIS operator

**TEXT BOOKS:**

1. Reema Thareja, Programming In C, Oxford University Press.
2. Paul Dietel, Harvey Dietel, "C How to Program", 6th Edition, PHI, 2010.
3. Balagurusamy ,(2008), "Programming in ANSI C " , Fourth Edition -Tata McGraw Hill
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5. Yashavanth Kanetkar, (2008), "Let us C++", Fourth Edition -BPB Publications.

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2. <https://www.guru99.com/c-programming-tutorial.html>
3. <https://www.w3schools.in/c++-tutorial>
4. <https://www.programiz.com/c++-programming>
5. <https://www.javatpoint.com/c++-programming-language-tutorial>

**PEDAGOGY (TEACHING METHODOLOGY):**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO / PSO</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO1</b>	3	2	2	3	3
<b>CO2</b>	3	2	1	3	3
<b>CO3</b>	3	2	1	2	3
<b>CO4</b>	3	2	2	3	3
<b>CO5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

**SEMESTER I**  
**WEB DESIGNING LAB**

**TOTAL HOURS: 60**  
**CREDIT: 2**

**SUBCODE: 20UCACP1002**  
**L-T-P: 0-0-3**

**COURSE OBJECTIVES**

1. To make the student learn a programming language.
2. To learn problem solving techniques.
3. To teach the student to write programs in Web Designing.

**COURSE OUTCOMES:** on completion of the course the students will be able to...

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	To understand and apply the role of languages like HTML5, CSS, JavaScript, in the working of the web document and web applications.
<b>CO2</b>	To analyse a web page and identify its elements and attributes.
<b>CO3</b>	To understand the usage of HTML5, JavaScript and CSS concepts to develop WebPage.
<b>CO4</b>	To implement the form designing and changes across the website can be done all at once using CSS.
<b>CO5</b>	Create dynamic web pages using JavaScript.

**List of Programs**

**HTML 5 LAB**

1. Create a Web Page for your Personal Information using text formatting tags.
2. Create a web page to display railway train timings.
3. Create a sample web page to promote a product using frames and links.
4. Working with lists.
5. Create a web document that uses structural and semantic.
6. Create an web page that uses HTML5 new input fields.
7. Write a program to Fill color inside a rectangle and circular shape on canvas tag.
8. Create a link with a media attribute.
9. Write a program to create lines, rectangle, and circle using SVG into pages.
10. Create a web page that implements the HTML5 drag and drop feature.



### **CSS3 LAB**

1. Write a program to set the background-color of different elements.
2. Write a program to set all the border properties in one declaration.
3. Write a program to slice the image specified by border-image-source.
4. Write a program to add shadow to text.
5. Write a program to bind an animation to a division element.
6. Write a program to use animation-delay and then start the animation.
7. Write a program to specify a gap between the columns.
8. Write a program to set box-shadow to a division element.
9. Write a program to implement flex-basis property specifies the initial length of a flexible item.
10. Write a program to display different type of cursor.

### **JAVA SCRIPT LAB**

1. Create a JavaScript program to sort the given numbers in ascending and descending order.
2. Working with mouse events.
3. Manipulation of Strings.
4. Create a web page for getting personal details using form controls.
5. Write a program to design a calculator.

### **TEXT BOOKS:**

1. Ivan Bayross ,Web Enabled Commercial Applications Development Using Html, DHTML, Javascript, Perl, CGI 3rd Revised Ed-BPB.
2. Thomas A. Powell , (2010), HTML & CSS: The Complete Reference, Fifth Edition, McGraw-Hill Publications,
3. Gugoiu,Teodoru , (2016), HTML,XHTML,CSS and XML by example, ,Firewall Media,First edition
4. Robson, Elisabeth & Freeman , Head first HTML and CSS, ,Eric,O'reilly, Second Edition.
5. Steven Webber , Willam Alvin Newton ,(2019),Computer Programming JavaScript, Python, HTML, SQL, CSS

### **BOOKS FOR REFERENCE:**

1. Laura Lemay , Rafe Colburn ,Jennifer Kyrnin, Mastering HTML, CSS & Javascript Web Publishing,
2. Esposito Dino, Modern Web Development: Understanding Domains, Technologies, And User Experience,
3. Joel Sklar , Principles Of Web Design
4. JAMSA and KRIS ,HTML & WEB DESIGN: TIPS & TECHNIQUES , McGraw Hill
5. HTML5: Up and Running, Mark Pilgrim

## **E-LEARNING RESOURCES:**

1. <https://www.w3.org/standards/webdesign/htmlcss>
2. <http://www.htmlandcssbook.com/>
3. [https://www.tutorialspoint.com/html/html\\_style\\_sheet.htm](https://www.tutorialspoint.com/html/html_style_sheet.htm)
4. <https://progate.com/languages/html>
5. <https://www.sitepoint.com/html-css/>

## **PEDAGOGY (TEACHING METHODOLOGY):**

Power Point Presentation, Exercises (Individual)

## **Mapping of CO with PSO:**

<b>CO / PSO</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO1</b>	3	2	2	3	3
<b>CO2</b>	3	2	1	3	3
<b>CO3</b>	3	2	1	2	3
<b>CO4</b>	3	2	2	3	3
<b>CO5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

**SEMESTER II  
PYTHON PROGRAMMING**

**TOTAL HOURS: 75**

**SUB CODE:**

**CREDIT: 4**

**L-T-P: 3-1-0**

**COURSE OBJECTIVES:**

1. To understand why Python is a useful scripting language for developers.
2. To learn how to write loops, decision statements, functions and pass arguments in Python.
3. To learn how to use lists, tuples and dictionaries in Python Programs.
4. To provide a strong foundation of fundamental concepts in Artificial Intelligence

**COURSE OUTCOMES:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Explain the basic principles of Python programming.
<b>CO 2</b>	Apply the concepts of functions, conditional and looping statements in programming.
<b>CO 3</b>	Demonstrate the uses of Python String, lists, dictionaries and Tuples.
<b>CO 4</b>	Identify the file handling operations, Classes and Inheritance concepts.
<b>CO 5</b>	Discuss the fundamental understanding of various applications of AI, Deep learning, neural networks and other machine learning models.

**SYLLABUS:**

**UNIT I:**

**15 Hrs**

The python programming language-Formal and natural languages -values and types –variable names and keywords-Operators and operands- Expression and statements-interactive mode and script mode-order of operations -comments-Debugging.

**UNIT II:**

**15 Hrs**

Function: Function Calls-Type conversion functions-math functions-Definitions and uses-Parameters and arguments-variables and parameters are local. Conditional and recursion: Conditional Execution-Alternative execution-chained conditionals-Nested conditionals-Recursion-base case-infinite recursion.

**UNIT III:**

**15 Hrs**

Iteration: Multiple assignments-updating variables –the while statement –break-for loop-range function. Strings -string slices-String are immutable-string methods-The in operator. Lists-list are mutable-list operations-list slice-list methods-map, filter and reduce-deleting elements. Dictionary-looping and dictionaries-dictionary and list-global variables.

**UNIT IV: 15 Hrs**

Tuples: Tuples are immutable- Tuple Assignments-Tuples as return values-Variable-length argument tuples-List and Tuples-Dictionaries and Tuples. Files: reading and writing-format operator-filenames and path-catching exception-writing modules. Classes and Methods. Inheritance

**UNIT V: 15 Hrs**

Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc. GUI Programming: Tkinter introduction, Tkinter and PythonProgramming, Tk Widgets, Tkinter examples. Python programming with IDE.

**TEXT BOOKS:**

1. Allen Downey, Think Python, Green Tea Press
2. Paul J. Deitel, Harvey Deitel ,( 2019 ),Python for Programmers, Addison-Wesley
3. Ashok Namdev Kamthane, Amit Ashok Kamthane, (2017), Programming and Problem Solving with Python, First Edition.
4. E. Balagurusamy, (2017), Problem Solving and Python Programming, First Edition, McGraw-Hill Publication.
5. Joel Murach and Michael Urban (2016), Murach’s Python programming, Mike Murach& Associates, First Edition.

**BOOK FOR REFERENCES:**

1. Mark Lutz, Learning Python, Orielly
2. Vamsi Kurama, Python Programming: A Modern Approach, Pearson
3. Kumar Naveen, Taneja Sheetal, Python Programming A modular approach, Pearson
4. Timothy A Budd (2009), Exploring Python, McGraw-Hill Education.
5. Burkhard A. Meier (2015), Python GUI Programming Cookbook ,Packt Publishing, First Edition.

**E-LEARNING RESOURCES:**

1. <https://www.learnpython.org/>

2. <https://www.programiz.com/python-programming>
3. <https://www.guru99.com/python-tutorials.html>
4. [https://onlinecourses.nptel.ac.in/noc20\\_cs70/preview](https://onlinecourses.nptel.ac.in/noc20_cs70/preview)
5. <https://www.studytonight.com/python/>

**PEDAGOGY (TEACHING METHODOLOGY):**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	3	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	3	3

**SEMESTER II  
PYTHON LAB**

**TOTALHOURS: 60**  
**CREDIT: 2**

**SUB CODE:**  
**L-T-P: 0-0-3**

**COURSE OBJECTIVES:**

1. To write, debug and execute simple Python programs.
2. To implement branching and looping statements in Python programs
3. Use functions for structuring Python programs.
4. Represent compound data using Python lists, tuples, and dictionaries.
5. Read and write data from/to files in Python.

**COURSE OUTCOMES:** upon completion of the course, students will be able to...

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Create, debug and execute simple Python programs.
<b>CO 2</b>	Implement Python programs with branching and looping statements.
<b>CO 3</b>	Develop Python programs using built-in and user defined functions.
<b>CO 4</b>	Demonstrate the use of Python lists and dictionaries.
<b>CO 5</b>	Apply classes, file and exception handling mechanism.

**List of Practical Programs:**

1. Write a Python program to find the given number is prime or not prime.
2. Write a Python program to calculate the simple and compound interest.
3. Write a Python program to generate the Fibonacci series.
4. Write a Python program using conditional statements.
5. Write a program to multiply two matrices using nested loops.
6. Write a Program to find the maximum of a list of numbers.
7. Write a Python program to find the addition of two matrix.
8. Write a Python program to find whether the given string is a palindrome or not.
9. Write a Python program to implement string function.
10. Write a Python program to find the factorial of a given number using Recursion.
11. Write a Python program to get the largest number from a list using function.
12. Write a python program to demonstrate File Input and Output operations.

13. Write a Python program to append text to a file and display the content.
14. Write a program to demonstrate Classes and their Attributes.

### **TEXT BOOKS:**

1. Allen Downey, Think Python, Green Tea Press
2. FRANÇOIS CHOLLET ,Deep Learning with Python
3. Ashok Namdev Kamthane, Amit Ashok Kamthane, (2017), Programming and Problem Solving with Python, First Edition.
4. E. Balagurusamy, (2017), Problem Solving and Python Programming, First Edition, McGraw-Hill Publication.
5. Joel Murach and Michael Urban (2016), Murach's Python programming, Mike Murach & Associates, First Edition.

### **BOOK FOR REFERENCES:**

1. Mark Lutz, Learning Python, Orielly
2. Vamsi Kurama, Python Programming: A Modern Approach, Pearson
3. Kumar Naveen, Taneja Sheetal, Python Programming A modular approach, Pearson
4. Timothy A Budd (2009), Exploring Python, McGraw-Hill Education.
5. Burkhard A. Meier (2015), Python GUI Programming Cookbook ,Packt Publishing, First Edition.

### **E-LEARNING RESOURCES:**

1. <https://www.w3schools.com/python/>
2. <https://www.programiz.com/python-programming>
3. <https://skillcrush.com/blog/python-programming-examples/>
4. <https://beginnersbook.com/2018/02/python-programs/>
5. <https://www.freecodecamp.org/news/python-example/>

### **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Discussion, Projector, Exercise (individual)

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	3	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	3	3

**SEMESTER II**  
**UNIX AND SHELL PROGRAMMING LAB**

**TOTALHOURS: 60**  
**CREDIT: 2**

**SUBCODE: 20UCACP2004**  
**L-T-P: 0-0-3**



## COURSE OBJECTIVES

1. To make the student learn a programming language.
2. To learn problem solving techniques.
3. To teach the student to write programs in Unix

**COURSE OUTCOMES:** on completion of the course the students will be able to...

CO No.	CO Statement
CO1	To implement the file concepts and user logs
CO2	To understand the function structure and directories concepts.
CO3	To understand the sorting concept and file allocations methods.
CO4	To implements the string manipulation.
CO5	To implements the small scale problems.

## SYLLABUS

### List of Programs:

1. Write a shell script which receives two file names as arguments. Check whether the file contents are same or not. If same delete the second file.
2. Write shell script, which gets executed the moment the user logs in, it should display the message GOOD MORNING/GOOD AFTERNOON/GOOD EVENING depending on the time and user logs in.
3. Write a function GO which would change the \$ prompt to the current directory name in which you are working. Thus if you are working in \usr\acc the prompt should look like \usr\acc.
4. Write a shell script which displays a) List of all files in the current directory to which you have read, write and execute permissions. b) Receive any number of filenames as arguments and check whether the argument supplied is a file or directory. If it is a directory it should appropriately reported. If it is a filename then name of the file as well as the number of lines present in it should be reported.
5. Write a shell script to search a file from the current directory in any of the sub-directories and report the path.
6. Create a file called TEST which contains sample data as follows.  
A00001 Shanthi 80,A00007Arun 70 ,S00005 Karthi 50 . Answer the following questions based on the above.
  - Display the contents of the file sorted according to the marks in the descending order.

- Display the names of the students in the alphabetical order ignoring the cases.
  - Display the list of students who have scored marks between 60 and 80.
  - Display the list of students and their register number.
7. Write a shell script to prepare a pay slip.
  8. Write a shell script to check if the inputs string is a palindrome.
  9. Write a shell script to accept two file names and check whether both exist. If the second file name exists then the contents of the first file name should be appended to it. If the second file name does not exist then create a new file with the contents of the first file name.
  10. Write a shell script to accept a number in the command line and display the sum up to that number.

### **TEXT BOOKS:**

1. Anoop Chaturvedi , B.L. Rai, Unix and Shell Programming,
2. Behrouz A. Forouzan , Richard F. Gilberg ,UNIX and Shell Programming,
3. Mark G. Sobell,A Practical Guide to Linux Commands, Editors, and Shell Programming (3rd Edition) 3rd Edition,
4. Peter Seebach ,Beginning Portable Shell Scripting: From Novice to Professional
5. M.G. Venkateshmurthy ,Introduction to Unix and Shell Programming,

### **BOOKS FOR REFERENCE:**

1. Kernighan (Brian W) And Pike (Rob),Unix Programming Environment
2. Kanetkar, Yashavant, P.,Bpb, Unix Shell Programming,
3. Das,Sumitabha ,Unix Concepts And Applications,,Mcgraw Hill
4. Verma Archana , Unix and Shell Programming , Laxmi Publications
5. Anoop Chaturvedi , (2011), Unix and Shell Programming, Laxmi Publications

### **E-LEARNING RESOURCES:**

1. <https://www.guru99.com/introduction-to-shell-scripting.html>
2. [https://www.tutorialspoint.com/unix/shell\\_scripting.htm](https://www.tutorialspoint.com/unix/shell_scripting.htm)
3. <https://www.shellscript.sh/>
4. <https://www.unf.edu/~cwinton/html/cop3601/supplements/SoCUnixShellProg.html>
5. <https://www.shellscript.sh/>

### **PEDAGOGY (TEACHING METHODOLOGY):**

Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO / PSO</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO1</b>	3	2	2	3	3
<b>CO2</b>	3	2	1	3	3
<b>CO3</b>	3	2	1	2	3
<b>CO4</b>	3	2	2	3	3
<b>CO5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

## SEMESTER III

### PROGRAMMING IN KOTLIN

**TOTALHOURS: 75**

**CREDIT: 4**

**SUB CODE:**

**L-T-P : 3 -2 – 0**

#### COURSE OBJECTIVES:

1. Understanding the fundamentals of Kotlin.
2. Gain knowledge about Object oriented concepts, Higher order function
3. Understand the concepts of data class and collection

**COURSE OUTCOMES:** on completion of the course the students will be able to

CO No.	CO Statement
CO 1	To learn the basic of kotlin.
CO 2	To know the OOPs concepts and Functions
CO 3	To understand the Higher order function and Properties
CO 4	To know the Nullable types and Generics
CO 5	To understand Data class and the Collections

#### SYLLABUS

##### UNIT I:

Introducing Kotlin: Kotlin's primary traits-Kotlin Applicatins-The Philosophy of Kotlin-Using the Kotlin tools-Basic elements:functions and variables-classes and properties-Representingand handling choices:enums and "when"-Iterating over things: "while" and "for" loops -Exceptions in Kotlin.

##### UNIT II:

Defining and calling functions:Creating collections in Kotlin-Making functions easier to call-extension functions and properties-working with collections:varargs,infix calls and library support-working with strings and regular expressions-local functions and extensions

##### UNIT III:

Classes,objects and interfaces: Defining class hierarchies-Declaring a class with nontrivial constructors or properties-data classes and class delegation-declaring a class and creating an instance,combined-Lambda expressions and member references-Functional APIs for collections-Lazy collection operations:sequences-Lambdas with recievers:"with" and "apply"

##### UNIT IV:

The Kotlin types system: Nullability-Primitive and other basic types-collections and arrays-Overloading arithmetic operators-overloading comparison operators-conventions used for collections and ranges-Reusing property accessor logic: delegated properties

**UNIT V:**

Declaring higher-order functions-Inline functions:removing the overhead of lambdas-control flow in higher-order functions-Genric type parameter-Generics at runtime:erased and reified type paraemters-Variance:generics and subtyping.

**TEXT BOOKS:**

1. Dmitry Jemerov and Svetlana Isakova,Kotlin in Action,Manning publications ,1<sup>st</sup> edition 2017
2. David Greenhalgh and Josh Skeen, Kotlin Programming: The Big Nerd Ranch Guide,Pearson Education,2018
3. Dawn Griffiths ,David Griffiths ,Head First Kotlin: A Brain-FriendlyGuide, O'Reilly Publications,2019
- 4.Stephen Samuel,Stefan, Programming Kotlin, Packt publishing, 2017
5. VenkatSubramaniam ,ProgrammingKotlin: Create Elegant, Expressive, and PerformantJvm and Android Applications , 2019

**BOOK FOR REFERENCE:**

1. Pierre-Yves Saumont ,The Joy of Kotlin , Manning publications, 2019
2. Ken Kousen ,,Kotlin Cookbook: A Problem-Focused Approach ,O'Reilly Publications,2019
3. Bruce Eckel , Svetlana Isakova, Atomic Kotlin ,Mindview publications, 2021
4. AlekseiSedunov, Kotlin In-Depth [Vol-I]: A Comprehensive Guide To Modern Multi-Paradigm Language: A Comprehensive Guide to Modern Multi-Paradigm ,BPB Publications; First edition,2020
5. Ray Wenderlich, Irina Galata, Ellen Shapiro, Joe Howard,Kotlin Apprentice (Second Edition): Beginning Programming with Kotlin, Razeware publications, 2021

**E-LEARNING RESOURCES:**

1. <https://www.javatpoint.com/kotlin-tutorial>
2. <https://www.w3schools.com/kotlin/index.php>
3. <https://www.tutorialspoint.com/kotlin/index.htm>
4. <https://www.programiz.com/kotlin-programming>
5. <https://www.guru99.com/kotlin-tutorial.html>

**PEDAGOGY (TEACHING METHODOLOGY):**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## SEMESTER III

### DATA STRUCTURES AND ALGORITHMS

**TOTAL HOURS: 75**

**CREDIT: 4**

**SUB CODE: 20UCACT3004**

**L-T-P : 3 - 2 - 0**

#### COURSE OBJECTIVES:

1. To understand the different methods of data organization like linear and non-linear structure.
2. To learn the various operations are performed in linear and non-linear structure.
3. To study various algorithms of Sorting, Searching methods in Data structures.

**COURSE OUTCOMES:** on completion of the course the students will be able to

CO No.	CO Statement
CO 1	Understanding the concepts of data structures and complexity of algorithms.
CO 2	Implement operations like searching, insertion, and deletion, traversing mechanism of Stack and Queue.
CO 3	Discuss about linked list, operations and its applications.
CO 4	Identify the nonlinear data structure and indexing techniques.
CO 5	Demonstrating the various algorithms of Sorting, Searching methods in Data structures.

#### SYLLABUS:

##### UNIT I

**15 Hrs**

Definition of Data Structure-Primitive and Composite Data Types, Asymptotic notations, Arrays, Operations on Arrays, Order lists.

##### UNIT II

**15 Hrs**

Stacks- Operations on Stacks, Application of Stack-Infix to Postfix Conversion, Recursion, Maze Problems-Queues-Operations on Queues, Queue Application, Circular Queue.

##### UNIT III

**15 Hrs**

Singly Linked List-Operations, Application-Representation of a Polynomial, Polynomial addition; Doubly Linked List-Operations, Applications-Ordering of Books in Library

(Alphabetical Ordering).

#### **UNIT IV**

**15 Hrs**

Trees and Graphs: Binary Trees-Conversion of Forest to Binary Tree, Operations-Tree Traversals; Graph-Definition, Types of Graphs, Hashing Table and Hashing Functions, Traversal-Shortest Path; Dijkstra's Algorithm.

#### **UNIT V**

**15 Hrs**

Algorithm-Definition - Examples-Complexity-Divide and Conquer-Binary Search-Maximum and Minimum-Merge Sort.

#### **TEXT BOOKS:**

1. E.Horowitz and S.Shani ,( 1999),Fundamentals of Data Structures in C++, Galgotia Pub.
2. P.Sudharsan and J.JohnManoj Kumar ,C++ & Data Structures, RBA Publications, First Edition
3. Yashavant Kanetkar, Data Strucutre Through C++, BPB Publication
4. Ashok N Kamthane,(2004),“Programming and Data Structures”, First Edition,PearsonEducation.
5. AlfredV.Aho,JohnE.Hopcroft,Jeffrey D.Ullman,(2006) – “DataStrcures and algorithms”, Pearson Education,.

#### **BOOKS FOR REFERENCE:**

1. Horowitz, S.Sahni,andS.Rajasekaran, Computer Algorithms, Galgotia Pub. Pvt. Ltd., 1998.
2. R.F.Gilberg, B.A.Forouzan, Data Structures, Thomson India Edition, 2005.
3. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++,”, Pearson Education, Second Edition
4. Narasimha Karumanchi,(2019),Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles
5. Sandip sen, Amit Kumar, (2019),Design and Analysis of Algorithms - A Contemporary Perspective

#### **E-LEARNING RESOURCES:**

1. <https://www.w3schools>
2. <https://www.programiz.com/dsa>
3. <https://nptel.ac.in/courses/106102064/1>
4. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/tree\\_traversal.htm](https://www.tutorialspoint.com/data_structures_algorithms/tree_traversal.htm)
5. <https://www.studytonight.com/data-structures/doubly-linked-list>



## **PEDAGOGY (TEACHING METHODOLOGY):**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

### **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## SEMESTER III

### COMPUTER ARCHITECTURE

**TOTAL HOURS: 75**

**SUB CODE: 20UCACT3005**

**CREDIT: 4**

**L-T-P : 2 - 2 - 0**

#### **COURSE OBJECTIVES:**

1. To learn the digital components and their representations.
2. To study various data transfer techniques in digital computer.
3. To understand the concept of I/O and memory organization.

**COURSE OUTCOMES:** on completion of the course the students will be able to...

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Describe the major components of a digital components and micro-operations.
<b>CO 2</b>	To understand the concepts of stack organization, types of instructions Addressing modes, RISC architectures and program control.
<b>CO 3</b>	Ability to understand the basic arithmetic operations. Understand the concept of Floating point on arithmetic operations.
<b>CO 4</b>	Ability to understand the concept of I/O organization. To conceptualize the basics of interrupts, DMA and serial communications.
<b>CO 5</b>	Discuss about the concept of cache and virtual memory.

#### **SYLLABUS:**

##### **UNIT 1**

**15 Hrs**

Digital Components: Decoders-Multiplexers-Registers-Binary Counters. Data Representations-Micro operations: Register transfer language, Register transfer, Bus and Memory transfer, Arithmetic, logic, and shift micro operations, Arithmetic logic shift unit.

##### **UNIT 2**

**15 Hrs**

Micro programmed control - control memory - Address sequencing - micro program example - design of control unit. Central Processing Unit – General Register Organization – Stack Organization – Instruction format – Addressing modes – Data transfer and Manipulation – Program Control – Reduced Instruction Set Computer (RISC)

**UNIT 3****15 Hrs**

Parallel Processing-Pipelining - Arithmetic and instruction, RISC pipeline - Vector processing and Array processors-Attached Array Processor and SIMD Array Processor.

**UNIT 4****15 Hrs**

Input-Output Organization: Peripheral device – Input-Output Interface – Asynchronous data transfer – Modes of Transfer – Priority Interrupt - Direct Memory Access - Input Output Processor – Serial Communication.

**UNIT 5****15 Hrs**

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative, Cache and Virtual Memory.

**TEXT BOOKS:**

1. M. Morris Mano, “Computer System Architecture”, Third Edition, PHI.
2. V.Vijayendran, ”Digital Fundamentals”, Third Edition.
3. Morris Mano, (2007) - “Digital Logic and Computer Design” – Zeroth Edition - Prentice Hall of India, New Delhi
4. Thomas C Bartee , (1991) - “Digital Computer Fundamentals”, Tata Mc Graw Hill Publications, New Delhi , 6 th Edition
5. John P Hayes, (1998), “Computer Architecture and Organization”- Third Edition - McGraw Hill International.

**BOOKS FOR REFERENCE:**

1. W. Stallings, “Computer Organization and Architecture”, Sixth Edition, 2003, PHI.
2. Carl Hamacher V., Zvonko G. Vranesic, Safwat G. Zaky, "Computer organization" Fifth Edition, 2001, Tata McGraw-Hill.
3. Heuring V.P., Jordan H.F., “Computer System Design and Architecture”, Second Edition, 2001, Addison Wesley.
4. Ghosh T. K., “Computer Organization and Architecture”, Tata McGraw-Hill, Third Edition, 2011
5. Kai Hwang & Naresh Jotwani, ”Advanced Computer Architecture”, McGraw Hill, Third Edition, 2016

**E-LEARNING RESOURCES:**

1. [www.csi.ucd.ie/staff/jcarthy/home/alp/alp6.html](http://www.csi.ucd.ie/staff/jcarthy/home/alp/alp6.html)
2. [www.cs.iastate.edu](http://www.cs.iastate.edu)
3. <https://www.slideshare.net/KamalAcharya/pipelining-and-vector-processing>
4. <https://nptel.ac.in/courses/106/105/106105163/>
5. <https://nptel.ac.in/courses/106/102/106102062/>

## **PEDAGOGY (TEACHING METHODOLOGY):**

Lecture -Black Board Teaching, Power Point Presentation, Discussion, Question and Answer

### **Mapping of CO with PSO:**

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	3	3	3
CO 2	3	2	2	3	3
CO 3	3	2	1	2	3
CO 4	3	2	2	3	3
CO 5	3	2	2	3	3
Average	3	2	2	2.8	3

## SEMESTER III

### KOTLIN LAB

**TOTALHOURS: 60**  
**CREDIT: 2**

**SUB CODE:**  
**L-T-P : 0 - 0 - 4**

#### **COURSE OBJECTIVE:**

1. To create and develop basic programs.
2. To create and implement functions .
3. Understand the concept of arrays and classes.

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	Write, debug and execute simple Kotlin programs.
<b>CO2</b>	Implement Array concept in Kotlin programs.
<b>CO3</b>	Develop Kotlin programs with defining functions and passing parameters to function.
<b>CO4</b>	Implement class, constructor and inheritance in Kotlin Program.
<b>CO5</b>	Develop Kotlin program using Collection concept.

#### **LIST OF PROGRAMS**

##### **Basic**

1. Kotlin program to swap two numbers.
2. Kotlin program to check whether number is odd or even
3. Kotlin program to find the largest among three numbers
4. Kotlin program to check the Leap year
5. Kotlin program to make a simple calculator using switch... case.
6. Kotlin program to reverse the number

##### **Function**

7. Kotlin program to find the prime number between the intervals using the function
8. Kotlin program to display Armstrong number between the intervals using the function
9. Kotlin program to find the sum of natural number using recursion.
10. Kotlin program to find Fibonacci series using recursion.
11. Kotlin program to find G.C.D. using recursion.

## **Array**

12. Kotlin program to find transpose of a matrix
13. Kotlin program to multiply two matrices passing matrix to a function
14. Kotlin program to find largest element in an array.

## **Class and Object**

15. Kotlin program to add two complex number by passing class to a function.
16. Kotlin program using inheritance.
17. Kotlin program using constructor.

## **Collection**

18. Kotlin program to join two Lists.
19. Kotlin program convert List to Array and Vice-versa
20. Kotlin program to convert Map(Hash map) to List.

## **TEXT BOOKS:**

1. Samuel, Stefan Bocutiu ,Programming Kotlin by Stephen
2. Learn Kotlin Quickly: Coding For Beginners by JJ TAM
3. Milos Vasic ,Fundamental Kotlin
4. Hani M K, Exploring Kotlin
5. Mario Arias, Rivu Chakraborty,Functional Kotlin

## **BOOKS FOR REFERENCE:**

1. Nate Ebel, ,(2019), Mastering Kotlin,Packt Publishing
2. Marco Vermeulen, Runar Bjarnason, Paul Chiusano,Functional Programming in Kotlin
3. Tam sel ,KOTLIN FOR BEGINNERS
4. Moaml Mohmmmed ,(2020),Kotlin The Ultimate Beginner's Guide to Learn kotlin Programming Step by Step
5. Aleksei Sedunov ,(2020),Kotlin In-Depth [Vol-I]: A Comprehensive Guide to Modern Multi-Paradigm Language , BPB Publications

## **E-LEARNING RESOURCES:**

1. <https://kotlinlang.org>
2. <https://www.programiz.com/kotlin-programming>
3. <https://www.tutorialspoint.com/kotlin/index.htm>
4. <https://books.goalkicker.com/KotlinBook/>
5. [http://book.itep.ru/depository/languages/TR\\_EB\\_kotlin.pdf](http://book.itep.ru/depository/languages/TR_EB_kotlin.pdf)

## **PEDAGOGY:**

Program Demo – White Board teaching, Power Point Presentation

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	1	3	3
<b>CO 3</b>	3	2	1	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

## SEMESTER III

### DATA STRUCTURES USING C++ LAB

**TOTAL HOURS: 60**  
**CREDIT: 2**

**SUB CODE: 20UCACP3006**  
**L-T-P : 0 - 0 - 4**

#### **COURSE OBJECTIVES:**

1. To understand the various operations are performed in linear and non-linear data structure.
2. To learn and implement the applications of Stack and Linked list.
3. To develop the program for Sorting and Searching methods in Data structures.

**COURSE OUTCOMES:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Implement the operations of stack using Arrays.
<b>CO 2</b>	Implement the operations of queue using pointers.
<b>CO 3</b>	Create program to implement the applications of stack.
<b>CO 4</b>	Discuss the concept of doubly linked list.
<b>CO 5</b>	Utilize the pointer concept to perform the tree traversal.

#### **List of Programs:**

1. Implement PUSH,POP operations of stack using Arrays.
2. Implement PUSH,POP operations of stack using Pointers.
3. Implement add and delete operations of a queue using Arrays.
4. Implement add and delete operations of a queue using Pointers.
5. Conversion of infix to postfix using stack operations.
6. Postfix Expression Evaluation.
7. Addition of two polynomials using Arrays
8. Addition of two polynomials using Pointers.
9. Creation, Insertion, and Deletion in doubly linked list.
10. Binary tree traversals (in-order, pre-order and post-order) using linked list.



## **TEXT BOOKS:**

1. E.Horowitz and S.Shani Fundamentals of Data Structures in C++, Galgotia Pub.1999.
2. P.Sudharsan and J.JohnManoj Kumar ,C++ & Data Structures, RBA Publications, First Edition
3. Yashavant Kanetkar, Data Strucutre Through C++, BPB Publication
4. Ashok N Kamthane,(2004),“Programming and Data Structures”, First Edition,PearsonEducation.
5. AlfredV.Aho,JohnE.Hopcroft,Jeffrey D.Ullman,(2006) – “DataStructures and algorithms”, Pearson Education.

## **BOOKS FOR REFERENCE:**

1. Horowitz, S.Sahni,and S.Rajasekaran, (1998), Computer Algorithms, Galgotia Pub. Pvt. Ltd.,
2. R.Kruse C.L. Tondo and B.Leung,( 1997),Data Structures and Program design in C, PHI.
3. R.F.Gilberg, B.A.Forouzan,(2005), Data Structures, Thomson India Edition,
4. Narasimha Karumanchi,(2019),Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles
5. Sandip sen, Amit Kumar, (2019),Design and Analysis of Algorithms - A Contemporary Perspective

## **E-LEARNING RESOURCES:**

1. <https://www.w3schools>
2. <https://www.programiz.com/dsa>
3. <https://nptel.ac.in/courses/106102064/1>
4. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/tree\\_traversal.htm](https://www.tutorialspoint.com/data_structures_algorithms/tree_traversal.htm)
5. <https://www.studytonight.com/data-structures/doubly-linked-list>

## **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Discussion, Projector, Program Demo, Exercise (individual).

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	1	3	3
<b>CO 3</b>	3	2	1	2	3
<b>CO 4</b>	3	2	1	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.4	2.8	3

## SEMESTER III & IV

### INTRODUCTION TO CYBER SECURITY

**TOTAL HOURS: 20**

**SUB CODE: 20UCANE3001/ 20UCANE4002**

**CREDIT: 2**

**L-T-P : 2- 0 - 0**

#### **COURSE OBJECTIVES:**

4. To understand the concepts of Cyber security.
5. To learn and understand Malware.
6. To study various techniques of Cyber security.

**COURSE OUTCOMES:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Discuss the concept of Cyber Security
<b>CO 2</b>	To understand Malware functions.
<b>CO 3</b>	To understand the concept of Firewalls.

#### **SYLLABUS:**

##### **Unit-I:**

Introduction to Cyber Crime - Classification of Cyber Crimes – Reasons for commission of Cyber Crimes.

##### **Unit-II:**

Malware and Its Types - Kinds of Cyber Crimes.

##### **Unit-III:**

Cyber Security Techniques - Firewall and its uses.

#### **TEXT BOOKS:**

1. Introduction to Cyber Security: Fundamentals, Ugo Ekpo MBCS CITP
2. The Beginner's Guide: A Comprehensive Guide to Getting Started in Cyber security, Yuri Diogenes

### **E-LEARNING RESOURCES:**

1. <http://uou.ac.in/sites/default/files/slm/Introductioncyber>.
2. [https://www.tutorialspoint.com/fundamentals\\_of\\_science\\_and\\_technology/cyber\\_crime\\_and\\_cyber\\_security.htm](https://www.tutorialspoint.com/fundamentals_of_science_and_technology/cyber_crime_and_cyber_security.htm)

### **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Discussion, Projector, Exercise (individual).

### **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	2	2
<b>CO 2</b>	3	2	1	1	2
<b>CO 3</b>	3	2	1	2	2
<b>Average</b>	3	2	1.3	1.6	2

## SEMESTER IV

### OPERATING SYSTEMS

**TOTAL HOURS: 75**  
**CREDIT: 4**

**SUB CODE: 20UCACT4006**  
**L-T-P : 3 - 2 - 0**

#### **COURSE OBJECTIVES:**

1. To understand the main components of an operating system.
2. To understand the various resources managed by an operating system.
3. To gain knowledge about file concepts and storage structure.

**COURSE OUTCOMES:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Observe and Understand the fundamental components and different management functionalities of an operating system.
<b>CO 2</b>	Understand the Process Synchronization, deadlocks handling techniques along with examples.
<b>CO 3</b>	Exploring the knowledge about Memory management techniques, Virtual Memory and segmentation schemes.
<b>CO 4</b>	Understand the concepts like Demand paging and protection goals of the system.
<b>CO 5</b>	Discuss the maintenances of file concepts and storage structure like disk scheduling.

#### **SYLLABUS:**

##### **UNIT I**

**15 Hrs**

Introduction: Views – Goals – Types of system – OS Structure: Components – Services – System Calls. Process Management: Process - Process Scheduling – Cooperating Process – Interprocess Communication- Types of threads. CPU Scheduling: CPU Schedulers – Scheduling criteria – CPU Scheduling Algorithms.

##### **UNIT II**

**15 Hrs**

Process Synchronization: Critical-Section problem –Semaphores. Deadlocks: Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from deadlock.

**UNIT III****15 Hrs**

Memory Management: Address Binding – Dynamic Loading and Linking – Overlays – Swapping- Logical and Physical Address Space - Contiguous Allocation – Internal and External Fragmentation - Non-Contiguous Allocation- Paging and Segmentation schemes.

**UNIT IV****15 Hrs**

Virtual Memory: Demand Paging –Page Replacement Algorithms Protection: Goals-Principles- Domain of Protection –Access Matrix.

**UNIT V****15 Hrs**

Case Study-The Linux System -Linux History -Design Principles -Kernel Modules -Process Management –Scheduling- Memory Management

**TEXT BOOKS:**

1. Silberschatz A., Galvin P.B., Gange,( 2015), “Operating System Concepts”, 7<sup>th</sup> Edition, John Wiley & Sons.
2. Andrew S. Tanenbaum, (2001) “Modern Operating Systems”, Second Edition, Addison Wesley,
3. Inderjeet kaur, Sonam Gupta, (2020),“Operating Systems: A Concept - Based Approach, Wiley,
4. Deitel,( 2007), Operating system,
5. Achyut S. Godbole,(1996), “Operating Systems”, Second Edition -Tata McGraw Hill Publishing Company Limited .

**BOOKS FOR REFERENCE:**

1. Bhatt P. C. P., (2010),“An Introduction to Operating Systems: Concepts and Practice”, Third Edition, Prentice Hall of India.
2. William Stallings,( 2015), “Operating Systems: Internals and Design Principles”, Pearson, Global Edition.
3. D M Dhamdhere, (2007), “Operating Systems: A Concept-based Approach”, Second Edition, Tata McGraw-Hill Education,.
4. Mukesh Singhal, (1994),Ohio State University, Columbus,“Advanced Concepts In Operating Systems”, McGraw-Hill Series in Computer Science,
5. Tanenbaum, A. and van Steen, M., (2007),Distributed Systems: Principles and Paradigms, 2nd ed, Prentice Hall

**E-LEARNING RESOURCES:**

1. <https://nptel.ac.in/courses/106108101/>
2. <https://w3schools.in/operating-system-tutorial>
3. <https://swayam.gov.in/course/237-operating-system>
4. <https://www.studytonight.com/operating-system/virtual-memory>
5. <https://afteracademy.com/blog/process-scheduling-algorithms-in-the-operating-system>

## **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

### **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## SEMESTER IV

### DATA COMMUNICATION AND NETWORK

**TOTAL HOURS: 75**  
**CREDIT: 4**

**SUB CODE: 20UCACT4007**  
**L-T-P: 2 - 2 - 0**

#### **COURSE OBJECTIVES:**

1. To understand the concepts of Computer Networks.
2. To learn the functionalities of different layers in TCP/IP.
3. To learn about Application layer and Presentation layer and its protocols.

**COURSE OUTCOMES:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Understand the basic concepts of networks.
<b>CO 2</b>	Analyse the types of transmission media and its performance.
<b>CO 3</b>	Discuss about multiplexing and switching concepts.
<b>CO 4</b>	Identify the network layer and protocols.
<b>CO 5</b>	Understand the Routing, application layers of TCP/IP and its services

#### **SYLLABUS**

##### **UNIT I**

**15 Hrs**

Introduction to data communication, network, protocols & standards organizations- line configuration- topology- transmission mode – classification of network – OSI model – layers of OSI model.

##### **UNIT II**

**15 Hrs**

Parallel and serial transmission –DTE/DCE/ such as EIA-499, EIA-530, EIA-202 and x21 interface- interface standards- modems – guided media – unguided media – performance – types of errors- error detection – error correction.

##### **UNIT III**

**15 Hrs**

Multiplexing – types of multiplexing – multiplexing application – telephone system – project 802 – Ethernet – token bus – token ring – FDDI – IEE 802.6 – SMDS- circuit switching – packet switching – message switching – connection oriented and connectionless services.



**UNIT IV****15 Hrs**

History of analog and digital network – access to ISDN – ISDN layers – broadband ISDN – X.25 layers – packet layer protocol - Network Security: Cryptography – DES – Digital Signatures: Symmetric-Key Signatures, Public-Key signatures.

**UNIT V****15 Hrs**

Repeaters – bridges - routers – gateway – routing algorithms – TCP/IP network, transport and application layers of TCP/IP – world wide web.

**TEXT BOOKS:**

1. Behrouz and Forouzan, (2001) Introduction to Data Communication and Networking - 2nd edition – TMH.
2. Brijendra Singh, (2014), Data Communications and Computer Networks, 4th edition
3. William Stallings, (2017), Data and Computer Communications, 10th edition
4. Kurose James, Ross Keth, (2017), Computer networking, top-down approach, 6th edition
5. I. A. Dhotre V. S. Bagad, (2016), Data communication and networking

**BOOKS FOR REFERENCE:**

1. Jean Warland ,( 1998), Communication Networks (A first course) , second edition , WCB/McGraw Hill
2. Behrouz and Forouzan ,( 2001), Introduction to Data Communication and Networking, 3rd edition – TMH
3. Gupta prakash, ( 2016 ), “Data Communications and Computer Networks”,
4. K. Govindarajan, G. Saravanan,(2019),Data Communications and Networking,
5. Tomasi Wayne , Introduction to Data communication and Networking, Pearson Education

**E-LEARNING RESOURCES:**

1. [https://www.tutorialspoint.com/data\\_communication\\_computer\\_network/index.htm](https://www.tutorialspoint.com/data_communication_computer_network/index.htm)
2. <https://www.javatpoint.com/computer-network-tutorial>
3. <https://www.guru99.com/data-communication-computer-network-tutorial.html>
4. <http://nptel.ac.in/courses/106106091/>
5. <http://nptel.ac.in/courses/106105080/>

**PEDAGOGY:**

Program demo – White board teaching, Power Point Presentation, Projector, Discussion

**Mapping of CO with PSO:**

<b>CO /PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	2	2	3	3
<b>CO2</b>	3	2	2	3	3
<b>CO3</b>	3	2	2	2	3
<b>CO4</b>	3	2	2	3	3
<b>CO5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## SEMESTER IV

### RELATIONAL DATABASE MANAGEMENT SYSTEM

**TOTAL HOURS: 75**

**CREDIT: 4**

**COURSE OBJECTIVES:**

**SUB CODE: 20UCACT4008**

**L-T-P: 3 - 2 - 0**

1. To learn the fundamentals of database and Relational Database Management System.
2. To make a study of SQL and relational database design.
3. To understand how to manipulate data using PL/SQL block.

**COURSE OUTCOMES:** On the completion of the course the students will able to

CO No.	CO Statement
CO 1	Knowledge in basic Database concepts, Database Design and Normalization Techniques.
CO 2	Adequately explain how to work and handle the errors in SQL Working Environment.
CO 3	To apply various DDL, DML, DCL commands, Built-in function, Grouping function and clauses.
CO 4	Understand the basic concepts, Embedded SQL and Exception handling in PL/SQL.
CO 5	Programming skill set in Advanced PL/SQL including procedures, functions, Triggers and Packages.

### SYLLABUS:

#### UNIT I

**15 Hrs**

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De normalization – Examples of Normalization.

#### UNIT II

**15 Hrs**

Oracle9i: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL \*Plus Environment – SQL – Logging into SQL \*Plus - SQL \*Plus Commands – Errors & Help – Alternate Text Editors - SQL \*Plus Worksheet - SQL \*Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table –

Table Types – Spooling – Error codes.

### **UNIT III**

**15 Hrs**

Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions – Grouping Data. Multiple Tables: Join – Set operations.

### **UNIT IV**

**15 Hrs**

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.

### **UNIT V**

**15 Hrs**

PL/SQL Composite Data Types: Records – Tables – Varrays. Named Blocks: Procedures – Functions – Packages – Triggers – Data Dictionary Views.

### **TEXT BOOKS:**

1. Nilesh Shah ,Database Systems Using Oracle , 2nd edition, PHI.
2. Abraham Silberschatz, Henry F.Korth and S.Sudarshan, Database System Concepts - Tata McGraw Hill Publications, Fifth Edition.
3. C.J.Date (2006), An Introduction to database systems, AddisonWesley, Third Edition.
4. Ivan Bayross,(1995),”Oracle 7 The Complete Reference”,BPB Publications.
5. Elmasri Navathe,(2001), “Fundamentals of Database Systems”, First Edition Pearson Education publication.

### **BOOKS FOR REFERENCE:**

1. Rajesh Narang, Database Management Systems, Prentice Hall of India, 2<sup>nd</sup> Edition.
2. Arun Majumdar & Pritimoy Bhattacharya, (2007), Database Management Systems, TMH.
3. Gerald V. Post, Database Management Systems, 3rd edition, TMH.
4. James.R.Groff and Paul.N.Weinberg (2008), The Complete Reference SQL, Tata McGraw Hill, Second Edition
5. P. S. Deshpande (2008), SQL/PL SQL for Oracle9i, Dream Tech Press, Reprint Edition.

## **E-LEARNING RESOURCES:**

1. <https://www.w3schools.com/sql/>
2. <https://www.tutorialspoint.com/sql/>
3. <https://beginnersbook.com/2015/04/rdbms-concepts/>
4. [https://www.w3schools.com/sql/trysql.asp?filename=trysql\\_asc](https://www.w3schools.com/sql/trysql.asp?filename=trysql_asc)
5. <https://www.oracletutorial.com/plsql-tutorial>

## **PEDAGOGY:**

Program demo – White board teaching, Power Point Presentation, Projector, Discussion.

## **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	3	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	3	3

## SEMESTER IV

### RDBMS LAB

**TOTAL HOURS: 60**  
**CREDIT: 2**

**SUB CODE: 20UCACP4007**  
**L-T-P: 0 - 0 - 4**

#### **COURSE OBJECTIVES:**

1. To learn the database basic commands.
2. To make a study of SQL and relational database design.
3. To understand how to manipulate data using PL/SQL block.

**COURSE OUTCOMES:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	Understand the basic commands, operators and built-in functions in SQL.
<b>CO 2</b>	To apply various key constraints and pattern matching in SQL.
<b>CO 3</b>	Developing simple programs using PL/SQL.
<b>CO 4</b>	Implementing the techniques of Procedures and Functions using PL/SQL.
<b>CO 5</b>	Implementing the techniques of Package and Triggers in PL/SQL.

#### **List of Programs:**

##### **SQL**

1. Write queries to create the following tables
  - i) EMPLOYEE (emp\_no,emp\_name,dob, address, city)
  - ii) WORKS (emp\_no, company-name,salary)
  - iii) COMPANY (company-name,city)
- a) Use insert command to add data according to the need of queries.
- b) Find the names of all employees who work for a particular company from the following tables.
- c) Find the names and city of residence of all employ
- ye who work for a particular company from the following tables.
- d) Find the names, address and city of residence of all employees who work for a particular company and earn more than Rs. 2,00,000 per annum. (Nested subquery) from the following tables.

e) Find the names of employees who are living in a particular city for a particular company (use group by clause)

2. Create the following tables with key constraints.

i) BOOK(Book\_Title, Pub\_Year, Unit\_Price, Author\_Name, Pub\_id) (Pub\_id is foreign key)

ii) AUTHOR (Author\_Name, Country)

iii) PUBLISHER (Pub\_id, Pub\_Name, Pub\_Address)

a) Insert values for all tables and display the table details.

b) Find the titles of the book with minimum/maximum price.

c) Increase the price of the book by 15% where price is less than 200.

d) Find the titles of the book price between 300 to 1000.

e) Find author\_name from AUTHOR where the second character of name is 'l' or 'a'.

f) Perform full join operation on BOOK and PUBLISHER table.

### **PL/SQL block**

1. Write a PL/SQL program to insert ten values in a table, check each value is odd or even and insert the output into the table

2. Use a cursor to select the five highest paid employees from the emp table.

3. Create a master and a transaction table. Write a PL/SQL code to update the master using transaction table.

4. Create a package, which consists of two procedures named hire\_employee which will insert new employee details into emp table and another procedure named fire\_employee which will delete an employee details from the database.

5. Write a PL/SQL block that will select all rows from a employee table. The block displays empno, empname, doj, dept, and experience column. Experience column should be calculated using current date and doj column.

6. Write a PL/SQL block to select only those rows where the ordered is 2000 from the item table and update the price to be three times the quantity and set the actual price column of the table to the value in price.

### **Procedures**

1. Create a procedure to calculate simple interest. Principal, rate of interest and no. of years are given as input.

2. Create a procedure to satisfy the following conditions accepting the route id as user input. Create suitable table(s).

a. If the distance is less than 500 then update the fare to be 190.98

b. If the distance is between 501-1000 then update fare to be 876.98

c. If the distance is greater than 1000 then update fare to be 1200.98

### **Functions**

1. Create a function that returns the empno of employees working in admin dept.

2. Create a function that finds out the result of a given student rollno.

### **Triggers**

1. Write a database trigger before insert/update/delete for each row and allowing any of the transactions on Mondays, Wednesdays and Fridays. Create suitable table(s)

a. The price of a product changes constantly. It is important to maintain the history of the prices of the products. Create a trigger to update the "Product\_price\_history" table when the price of the product is updated in the "Product" table. Create the "Product" table and

“Product\_price\_history” table with the following fields respectively Product\_price\_history (product\_id number(5), product\_name varchar2(32), supplier\_name varchar2(32), unit\_price number(7,2) )

b. Product (product\_id number(5), product\_name varchar2(32), supplier\_name varchar2(32), unit\_price number(7,2) )

2. Create the Price\_history\_trigger and execute it.

3. Update the price of a product. Once the update query is executed, the trigger fires and should updates the 'Product\_price\_history' table.

### **TEXT BOOKS:**

1. Nilesh Shah ,Database Systems Using Oracle, 2nd edition, PHI.
2. Abraham Silberschatz, Henry F.Korth and S.Sudarshan, Database System Concepts, Tata McGraw Hill Publications, Fifth Edition.
3. C.J.Date (2006), An Introduction to database systems, AddisonWesley, Third Edition.
4. Ivan Bayross,(1995),”Oracle 7 The Complete Reference”,BPB Publications.
5. Elmasri Navathe,(2001), “Fundamentals of Database Systems”, First EditionPearson Education publication.

### **BOOKS FOR REFERENCE:**

1. Rajesh Narang, Database Management Systems, Prentice Hall of India, 2<sup>nd</sup> Edition.
2. Arun Majumdar & Pritimoy Bhattacharya, (2007),Database Management Systems, TMH.
3. Gerald V. Post, Database Management Systems, 3rd edition, TMH.
4. James.R.Groff and Paul.N.Weinberg (2008), The Complete Reference SQL, Tata McGraw Hill, Second Edition
5. P. S. Deshpande (2008), SQL/PL SQL forOracle9i, Dream Tech Press, Reprint Edition.

### **E-LEARNING RESOURCES:**

1. [https://www.w3schools.com/sql/trysql.asp?filename=trysql\\_asc](https://www.w3schools.com/sql/trysql.asp?filename=trysql_asc)
2. <https://www.tutorialspoint.com/sql/>
3. <https://livesql.oracle.com>
4. <https://www.oracletutorial.com/plsql-tutorial>
5. <https://www.sqlshack.com/learn-sql-sql-triggers/>

### **PEDAGOGY:**

Program demo – White board teaching, Power Point Presentation, Projector, Discussion, Individual Exercise.



**Mapping of CO with PSO:**

<b>CO / PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	2	2	3	3
<b>CO2</b>	3	2	1	3	3
<b>CO3</b>	3	2	1	3	3
<b>CO4</b>	3	2	2	3	3
<b>CO5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	3	3

# SEMESTER V

## PROGRAMMING IN JAVA

**TOTAL HOURS: 75**

**SUB CODE: 20UCACT5009**

**CREDIT: 4**

**L-T-P: 3 -2 -0**

### COURSE OBJECTIVES:

1. Understanding the fundamentals of Java.
2. Gain knowledge about Object oriented concepts, Packages and Threads
3. Design Applet and AWT classes and controls.

**COURSE OUTCOMES:** On Completion of the course the students will be able to

CO No.	CO Statement
CO1	To learn the basics of Java and Object Oriented concepts in Java.
CO2	To Understand the Constructors and Overloading ,Inheritance concepts.
CO3	Demonstrate the concepts of package and Thread concepts.
CO4	To Know Applets and File Streams.
CO5	To use various AWT Classes.

### SYLLABUS:

#### UNIT I

**15 Hrs**

Introduction to Java-Features of Java-Object Oriented Concepts- Lexical Issues- data Types- Variables- Arrays-Operators-control Statements.

#### UNIT II

**15 Hrs**

Classes –Objects-Constructors-Overloading method-Access Control- Static and fixed methods- Inner Classes-String Class-Inheritance- Overriding methods-Using super Abstract class.

#### UNIT III

**15 Hrs**

Packages- Access Protection-Importing Packages-Interfaces- Exception Handling Throw and Throws-Thread-Synchronization- Messaging-Runnable Interface-Inter thread Communication- Deadlock- Suspending, Resuming and stopping threads-Multithreading.

#### UNIT IV

**15 Hrs**

I/OStreams-FileStreams-Applets-StringObjects-StringBuffer-CharArray-JavaUtilities- Working

with windows using AWT Classes – AWT Controls

## **UNIT V**

**15 Hrs**

JDBC Programming :The JDBC Connectivity Model, Database Programming: Connecting to the Database, Creating a SQL Query, Getting the Results, Updating Database Data, Error Checking and the SQLException Class, The SQLWarning Class, The Statement Interface, Prepared Statement, Callable Statement. The ResultSet Interface, Updatable Result Sets, JDBC Types, Executing SQL Queries, ResultSetMetaData, Executing SQL Updates, Transaction Management.

## **TEXT BOOKS :**

1. CayS.Horstmann,GaryCornell, (2000)-coreJava2VolumeI-Fundamentals,5<sup>th</sup>Edition.PHI.
2. P.NaughtonandH.Schildt ,(1999)-Java2(TheCompleteReference)-ThirdEdition TMH.
3. Cay S. Horstmann ,Core Java Volume I – Fundamentals by,Prentice Hall
4. Maydene Fisher, Jon Ellis, Jonathan Bruce, “JDBC API Tutorial and Reference”, Third Edition
5. Ogihara, Mitsunori ,Fundamentals of Java Programming

## **BOOKS FOR REFERENCE:**

1. E.Baluguruswamy,Programming with Java - A Primer
2. Xavier.C,Programming with Java 2
3. K.ArnoldandJ.Gosling, (1996)-TheJavaProgrammingLanguage, SecondEdition AddisonWesley.
4. Herbert Schildt , Java: A Beginner;s Guide, Mcgraw-Hill Education.
5. Kathy Sierra & Bert Bates,Shroff ,Head First Java, O’Reilly

## **E-LEARNING RESOURCES**

1. <https://www.tutorialspoint.com/java/index.htm>
2. <https://www.javatpoint.com/java-tutorial>
3. <https://docs.oracle.com/javase/specs/jls/se8/jls8.pdf>
4. <https://www.codejava.net/books/4-best-free-java-e-books-for-beginners>
5. <http://greenteapress.com/thinkapjava/html/index.html>

## **PEDAGOGY:**

Program Demo – White Board teaching, Power Point Presentation

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## SEMESTER V

### PROGRAMMING IN PHP and MYSQL

**TOTAL HOURS: 75**

**CREDIT: 4**

**SUBCODE: 20UACT5010**

**L-T-P: 3 -2 -0**

#### **COURSE OBJECTIVES:**

1. To design and develop the dynamic web page using PHP
2. To Perform hands on Mysql database connectivity with PHP Page
3. To create Cookies and Session

**COURSE OUTCOMES:** On Completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	To Understand the working functionality of dynamic webpage
<b>CO2</b>	To Learn the syntax and semantics of PHP and Database basics
<b>CO3</b>	To use MySql Database connectivity to PHP and Forms
<b>CO4</b>	To learn the various functions in PHP and Database
<b>CO5</b>	To Utilize Cookies and Sessions.

#### **SYLLABUS**

##### **UNIT I**

**15 Hrs**

Dynamic Content and the Web - PHP and MySQL's Place in Web Development - The components of a PHP Application - Integrating Many Sources of Information - Requesting Data from a Web Page. Developing Locally - working remotely.

##### **UNIT II**

**15 Hrs**

Exploring PHP-PHP and HTML text - coding building blocks. PHP decision making- Expressions - Operator Concepts - Conditionals-Looping. Functions - calling functions - defining functions- Object-Oriented Programming. Arrays: Array fundamentals. Database basics: Data base design-Structured Query Language.

##### **UNIT III**

**15 Hrs**

Using MySQL: MySQL Database - Managing the Database - Backing up and Restoring Data - Advanced SQL. Getting PHP to talk to MySQL: The process-querying the database with PHP functions - Using PEAR. Working with Forms: Building a form - Templates.

**UNIT IV****15 Hrs**

String functions-Date and time functions - File Manipulation – Calling System Calls - Modifying MySQL objects and PH data: Changing database objects from PHP - Manipulating table data- displaying results with Embedded links- presenting a form to add and process in one file - updating data – deleting data – performing a subquery.

**UNIT V****15 Hrs**

Cookies, Sessions and Access Control: Cookies - PHP and HTTP Authentication – sessions - using Auth\_HTTP to Authenticate. Security: Session security. Validation and Error handling: Validating user input with JavaScript- Pattern Matching - Redisplaying a form after PHP validation fails. Building a Blog.

**TEXT BOOKS:**

1. Michele Davis, Jon Phillips, (2006)-Learning PHP and MySQL- edition, O'Reilly publication
2. W.Jason Gilmore -Beginning PHP and MySQL from novice to professional- 3rd edition, Apress publisher
3. Julie C. Meloni, (2012) Teach Yourself PHP, MySQL and Apache All in One: ·Pearson education publisher.
4. Luke Welling, Laura Thomson (2003),PHP and MySQL Web Development -fifth edition-sams publisher
5. Steven Holzner ,(2008), Php: The Complete Reference,Publisher:McGraw-Hill Education (India) Pvt Limited,By

**BOOKS FOR REFERENCE:**

1. W.Jason Gilmore -Beginning PHP and MySQL from novice to professional- 3rd edition, Apress publisher
2. VikramVaswani – PHP programming solutions-2007 edition- Tata McGraw Hill Publication
3. Michele E. Davis, Jon A. Phillips, Learning PHP & MySQL ·
4. Luke Welling, Laura Thomson ,( 2017), PHP and MySQL Web Development-fifth edition Pearson Education,Inc.
5. Jitendra Patel ,(2013), PHP and MySQL Practice It Learn It

**E-LEARNING RESOURCES**

1. [https://www.w3schools.com/php/php\\_mysql\\_intro.asp](https://www.w3schools.com/php/php_mysql_intro.asp)
2. <https://www.siteground.com/tutorials/php-mysql/>
3. [https://www.tutorialspoint.com/php/php\\_and\\_mysql.htm](https://www.tutorialspoint.com/php/php_and_mysql.htm)

4. [http://minitorn.tlu.ee/~jaagup/kool/java/kursused/14/webpr/beginning\\_php\\_and\\_mysql\\_from\\_novice\\_to\\_professional\\_4th\\_edition.pdf](http://minitorn.tlu.ee/~jaagup/kool/java/kursused/14/webpr/beginning_php_and_mysql_from_novice_to_professional_4th_edition.pdf)
5. <https://downloads.mysql.com/docs/apis-php-en.pdf>

## **PEDAGOGY:**

Program Demo – White Board teaching, Power Point Presentation

### **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	1	3	3
<b>CO 3</b>	3	2	1	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

**SEMESTER V**  
**SOFTWARE ENGINEERING AND TESTING**

**TOTAL HOURS: 75**  
**CREDIT: 4**

**SUB CODE: 20UCACT5011**  
**L-T-P: 3 -2 -0**

**COURSE OBJECTIVE:**

1. Learn the generic view of process and understand the process models
2. Learn the requirement engineering for the system model
3. Analyze the testing strategies.

**COURSE OUTCOME:** On Completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	To understand the concepts of software engineering, Layered technology, Process framework and CMMI process.
<b>CO2</b>	Utilize the concept of Software process model and System Engineering.
<b>CO3</b>	To Learn Software Requirement Engineering and Learn to design software and apply strategies of project management
<b>CO4</b>	Identify the quality assurance of a developed software product.
<b>CO5</b>	Apply the various testing strategies in the software system.

**SYLLABUS**

**UNIT I**

**15 Hrs**

Introduction to Software Engineering: The Software process: A generic view of process- Software Engineering –Layered technology, Process framework, CMMI ,Process patterns , Process assessment , Personal and Team process models ,Process technology, Product and Process.

**UNIT II**

**15 Hrs**

Process models: Waterfall model, Incremental Model, Evolutionary process models, Specialized Process models, Unified process. System engineering – computer based systems, System Engineering hierarchy, business process engineering, Product engineering, system modeling.

**UNIT III**

**15 Hrs**

Requirements Engineering- Bridge to design and construction. Requirements Engineering tasks,Initiating the requirements engineering process,Eliciting Requirements, Developing Use-cases,Building the analysis model,Negotiating Requirements and Validating Requirements.



**UNIT IV****15 Hrs**

Principles of Testing - White Box Testing- Black Box testing

**UNIT V****15 Hrs**

Integration Testing -System and Acceptance Testing

**TEXT BOOKS:**

1. Roger .S. Pressman ,Software Engineering – A Practitioner’s Approach : McGraw – Hill International Edition , Sixth Edition.
2. Srinivasan Desikan& Ramesh Gopalswamy, Software Testing Principles and Practices, Pearson Education.
3. B. B. Agarwal, S. P. Tayal, Mahesh Gupta, (2009),Software Engineering and Testing , Jones and Bartlett publisher.
4. Deepak Jain,Software Engineering: Principles and Practices
5. Ronald J. Leach ,Introduction to Software Engineering 2nd Edition

**BOOKS FOR REFERENCE:**

1. K.K. Aggarwal & Yogesh Singh, Software Engineering, New Age International publishers.
2. Ian Sommerville, Software Engineering-Pearson Education, Asia -3rd Edition
3. Richard Fairely ,Software Engineering-
4. Beizer Boris, Dreamtech, Software Testing Technique-
5. Hans van Vliet ,(2008), Software Engineering: Principles and Practice, 3rd edition, , John Wiley & Sons

**E-LEARNING RESOURCES**

1. <http://ceit.aut.ac.ir/~91131079/SE2/SE2%20Website/Lecture%20Slides.html>
2. [https://www.tutorialspoint.com/software\\_engineering/software\\_testing\\_overview.htm](https://www.tutorialspoint.com/software_engineering/software_testing_overview.htm)
3. <https://www.guru99.com/software-testing-introduction-importance.html>
4. [https://www.vssut.ac.in/lecture\\_notes/lecture1428551142.pdf](https://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf)
5. <https://www.softwaretestinggenius.com/download/staqtpsn.pdf>

**PEDAGOGY:**

Program Demo – White Board teaching, Power Point Presentation

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	1	3	3
<b>CO 3</b>	3	2	1	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

**SEMESTER V**  
**JAVA PROGRAMMING LAB**

**TOTAL HOURS:60**  
**CREDIT: 2**

**SUB CODE: 20UCACP5009**  
**L-T-P: 0 -0 -4**

**COURSE OBJECTIVE:**

1. Learn various Java Classes
2. Learn Utility Function and apply in the program
3. Utilize the various AWT control in program

**COURSE OUTCOME:** On the completion of the course the students will able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	Apply the Bufferclass and BufferedReader class in the program
<b>CO2</b>	Utilize the Point class and Random class
<b>CO3</b>	Create a Program using Vector class and Char Array
<b>CO4</b>	Create a Program using Threads and Exception handling
<b>CO5</b>	Design Applet program using AWT controls

**List of Program**

**Applications**

1. Substring Removal from a String. Use String Buffer class.
2. Finding area and Perimeter of a circle. Use Buffered Reader class
3. Determining the order of numbers generated randomly using Random class.
4. Implementation of Point Class for Image manipulation.
5. String Manipulation using Char Array.
6. Usage of Vector Classes.
7. Implementing Thread based applications & Exception Handling.
8. Application using synchronization such as Thread based, Class based and synchronized statements.

**Applets**

1. Working with Frames and various controls.
2. Working with Dialogs and Menus.
3. Working with Panel and Layout.
4. Working with Colors and Fonts.

## TEXT BOOKS:

1. E.Baluguruswamy ,Programming with Java, - A Primer
2. Xavier.C Programming with Java 2
3. Herbert Schildt ,Java: A Beginner’s Guide, ,McGraw-Hill Education
4. Kathy Sierra & Bert Bates,Shroff ,Head First Java, O’Reilly
5. K.Arnold andJ.Gosling,(1996) -TheJavaProgrammingLanguage – SecondEdition AddisonWesley.

## BOOKS FOR REFERENCE:

1. Kathy Sierra ,Head First Java 2e (A Brain Friendly Guide)
2. E.Baluguruswamy ,Programming with Java, - A Primer
3. Xavier.C Programming with Java 2
4. K.Arnold andJ.Gosling,(1996) -TheJavaProgrammingLanguage – SecondEdition AddisonWesley.
5. Paul Laurence ,Java Simple Beginner’s Guide to Java Programming

## E-LEARNING RESOURCES

1. <https://www.tutorialspoint.com/java/index.htm>
2. <https://www.javatpoint.com/java-tutorial>
3. <https://www.programiz.com/java-programming>
4. <https://www.w3schools.com/java/default.asp>
5. <https://www.guru99.com/java-tutorial.html>

## PEDAGOGY:

1. Program Demo – White Board teaching, Power Point Presentation

## Mapping of CO with PSO:

CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	2	3	3
CO 2	3	2	2	3	3
CO 3	3	2	2	3	3
CO 4	3	2	2	3	3
CO 5	3	2	2	3	3
Average	3	2	2	3	3

**SEMESTER V**  
**PHP AND MYSQL LAB**

**TOTAL HOURS: 60**  
**CREDIT: 2**

**SUB CODE: 20UCACP5010**  
**L-T-P: 0 -0 -4**

**COURSE OBJECTIVE:**

1. To apply the PHP basic syntax to create the program
2. To create the cookies and Session
3. To implement the several controls for form design.

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	Write the simple program using PHP
<b>CO2</b>	Utilize the Array and function concepts
<b>CO3</b>	Design the forms using the controls
<b>CO4</b>	Write the program using GET and POST method
<b>CO5</b>	Create the Cookies and session

**List of Programs**

1. Write a program in PHP to display date, month and year in a neat format.
2. Write a program in PHP to change background color based on day of the week using if else else if statements and using arrays
3. Write a program in PHP to force the text in a string to be all upper or lowercase
4. Write a program in PHP which writes the given number in words
5. Write a simple program in PHP for i) generating Prime number ii) generate Fibonacci series
6. Write a simple program in PHP to manipulate array values.
7. Write a program in PHP for processing a simple form ( use controls like checkbox, radio buttons and options ).

8. Write a program in PHP for processing a simple form ( use controls like checkbox, radio buttons and options ).
9. Write a function in PHP to generate random password
10. Write a program for a simple and fast calendar combining PHP and tables.
11. Write a program in PHP for a simple POST and GET functions.
12. Write a program in PHP for setting and retrieving a cookie
13. Write a program in PHP for exception handling for i) divide by zero ii) checking date format
14. Write a program in PHP for random text link advertising using predefined arrays
15. Write a program in PHP for a simple email processing.
16. Write a program for PHP for a login script

### **TEXT BOOKS:**

1. Michele Davis, Jon Phillips (2006)-Learning PHP and MySQL- edition, O'Reilly publication
2. W.Jason Gilmore -Beginning PHP and MySQL from novice to professional- 3rd edition, Apress publisher
3. Julie C. Meloni ,(2012) Teach Yourself PHP, MySQL and Apache All in One: · Pearson education publisher.
4. Luke Welling, Laura Thomson,(2003),PHP and MySQL Web Development -fifth edition-sams publisher
5. Php: The Complete Reference,Publisher:McGraw-Hill Education (India) Pvt Limited,By Steven Holzner · 2008

### **BOOKS FOR REFERENCE**

1. W.Jason Gilmore -Beginning PHP and MySQL from novice to professional- 3rd edition, Apress publisher
2. VikramVaswani – PHP programming solutions-2007 edition- Tata McGraw Hill Publication
3. Michele E. Davis, Jon A. Phillips, Learning PHP & MySQL ·
4. Luke Welling, Laura Thomson ,( 2017), PHP and MySQL Web Development-fifth edition Pearson Education,Inc.
5. Jitendra Patel ,(2013), PHP and MySQL Practice It Learn It

## E-LEARNING RESOURCES

1. <https://www.tutorialspoint.com/php/index.htm>
2. <https://www.javatpoint.com/php-tutorial>
3. <https://www.phptpoint.com/>
4. <https://www.w3schools.com/php/>
5. <https://downloads.mysql.com/docs/apis-php-en.pdf>

## PEDAGOGY:

1. Program Demo – White Board teaching, Power Point Presentation

## Mapping of CO with PSO:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	2	3	3
CO 2	3	2	1	3	3
CO 3	3	2	1	2	3
CO 4	3	2	2	3	3
CO 5	3	2	2	3	3
Average	3	2	1.6	2.8	3

**SEMESTER VI**  
**WEB TECHNOLOGY**

**TOTAL HOURS: 75**  
**CREDIT:4**

**SUB CODE: 20UCACT6012**  
**L-T-P: 4-2-0**

**COURSE OBJECTIVE**

1. Understand the concept of web client/server problems.
2. Analyze the various web server controls
3. Learn the security issues.

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	Learn the various HTML Tags and structure of ASP.Net and server controls.
<b>CO2</b>	Discuss about basic web server controls and data list web server controls
<b>CO3</b>	Understand the Validation control and Request and response object
<b>CO4</b>	Utilize the OLEDB connection
<b>CO5</b>	Understand the Application and security issues.

**SYLLABUS**

**UNIT I**

**15 Hrs**

Introduction to HTML Tags – ASP.NET Language Structure-Page event, properties & compiler Directives HTML server controls-Anchor, Tables, Forms.

**UNIT II**

**15 Hrs**

Files, Basic Web server controls-Label, textbox, Button, Image, links, check & Radio Button, Hyperlink Data List Web server controls-Checkbox list, Radio button list, Drop down list, Listbox, Data grid, Repeater.

**UNIT III**

**15 Hrs**

Other Web Server Controls: Calendar Control, AdRotator Control, Validation controls. Request and response objects, cookies.

**UNIT IV**

**15 Hrs**

Working with Data-OLEDB connection class, command class, transaction class, data adaptor class, data set class



**UNIT V****15 Hrs**

Advanced issues-Email, Application issues, working with IIS and page Directives-Error handling. Security-Authentication, IP Address, secure by SSL & client certificates.

**TEXT BOOKS:**

1. Greg Buczek ,Professional ASP XML ,Wrox Press Ltd. SPD Pvt. Ltd. ASP.NET Developers Guide,
2. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book (second edition), DT Editorial Services
3. Jackson,Web Technologies: A Computer Science Perspective , Pearson Education India
4. Anders Møller and Michael I. Schwartzbach,(2006),An Introduction to XML and Web Technologies Addison-Wesley.
5. Pankaj Sharma ,(2013),Fundamentals of Web Technology Paperback

**BOOKS FOR REFERENCE:**

1. T.A.Powell,( 2002),complete Reference HTML(Third edition)TMH
2. Mary Delamater, Anne Boehm, (2012 ),Murach's ASP.Net 4.5 Web Programming with VB ,fifth edition
3. Matthew MacDonald,ASP.Net: The Complete Reference by McGraw-Hill Companies
4. Bipin Joshi,Beginning SOLID Principles and Design Patterns for ASP.NET Developers
5. Dino Esposito (2018).Programming ASP.NET Core (Developer Reference)

**E-LEARNING RESOURCES:**

1. <https://www.w3schools.com/html/>
2. <https://dotnet.microsoft.com/apps/aspnet>
3. <https://www.pdfdrive.com/microsoft-asp-net-step-by-step-d11634486.html>
4. <https://www.tutorialspoint.com/asp.net/index.htm>
5. <https://www.javatpoint.com/asp-net-tutorial>

**PEDAGOGY:**

1. Program Demo – White Board teaching, Power Point Presentation

### Mapping of CO with PSO:

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

**SEMESTER VI**  
**WEB TECHNOLOGY LAB**

**TOTAL HOURS:60**  
**CREDIT: 2**

**SUB CODE: 20UCACT6011**  
**L-T-P: 0 -0 -5**

**COURSE OBJECTIVE:**

1. To create the web page using HTML tags
2. Learn to create the web Application with validation controls
3. Understand the concepts of virtual directory.

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO1</b>	Create the webpage using HTML tags
<b>CO2</b>	Design a form using ASP.NET
<b>CO3</b>	Create simple web Application using validation controls
<b>CO4</b>	Apply the Calendar control in the web page
<b>CO5</b>	Create Virtual directory in IIS

**LIST OF PROGRAMS**

**HTML**

1. Put an existing image on a web page. Create a table, use a heading and at least one use of rowspan/colspan. Colour a page and some text within the page. Link to another site.
2. Create a new file called index.html.
3. Put the normal HTML document structure tags in the file.
4. Give it a title.
5. At the bottom of the page (i.e. the last thing between the body tags) put the following;
6. A horizontal rule.
7. A link to your email addresses (with your name between the tag); remember to put the link to your email address within address tags.
8. A line break.
9. The date. (I have this same structure at the bottom of this page).
10. Above this block (which is called the footer), put a title in heading tags.
11. Add some text describing you. (You can split this into multiple headings and paragraphs if you wish).

## ASP.NET

1. Create a web form for online quiz. The score earned by the user should be displayed back.
2. Create a web form for an online library. This form must be able to accept the membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the books are to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls.
3. Create a web form for an online library. This form must be able to accept the membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the books are to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls. Display an advertisement at the bottom of the web from that you created.
4. Create an array containing the titles of five new movies .use this array as a data source for a drop down list control. The page must be capable of displaying the selected movies title to the user when the user clicks on the submit button.
5. Create a web application to generate employee payroll report. The form accepts the employee Id, employee name, basic pay. On submitting the form the allowances and deductions are calculated and display the respective report. Use proper validation controls.
6. Use a calendar control in the page to determine the current date (when the book is borrowed) and calculate the due date, which must be one week from the current date. Display the due date to the user.
7. Create a virtual directory in IIS. Create a global file and include the "session\_Start" and "session\_End" and, "Application\_Begin Request" and application End request" events. Write a simple ASP.NET page and execute it in the browser.

## TEXT BOOKS:

1. Greg Buczek ,Professional ASP XML ,Wrox Press Ltd. SPD Pvt. Ltd. ASP.NET Developers Guide,
2. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book (second edition), DT Editorial Services
3. Jackson,Web Technologies: A Computer Science Perspective , Pearson Education India
4. Anders Møller and Michael I. Schwartzbach,(2006),An Introduction to XML and Web Technologies Addison-Wesley.
5. Pankaj Sharma ,(2013),Fundamentals of Web Technology Paperback

## **BOOKS FOR REFERENCE:**

1. T.A.Powell,( 2002),complete Reference HTML(Third edition)TMH
2. Mary Delamater, Anne Boehm, (2012 ),Murach's ASP.Net 4.5 Web Programming with VB ,fifth edition
3. Matthew MacDonald,ASP.Net: The Complete Reference by McGraw-Hill Companies
4. Bipin Joshi,Beginning SOLID Principles and Design Patterns for ASP.NET Developers
5. Dino Esposito, (2018).Programming ASP.NET Core (Developer Reference)

## **E-LEARNING RESOURCES:**

1. <https://www.w3schools.com/html/>
2. <https://dotnet.microsoft.com/apps/aspnet>
3. <https://www.w3schools.com/asp/default.ASP>
4. <https://www.tutorialspoint.com/asp.net/index.htm>
5. <https://www.javatpoint.com/asp-net-tutorial>

## **PEDAGOGY:**

1. Program Demo – White Board teaching, Power Point Presentation

## **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	1	3	3
<b>CO 3</b>	3	2	1	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3

## SEMESTER VI

### NODE.JS LAB

**TOTAL HOURS: 60**  
**CREDIT: 2**

**SUB CODE:**  
**L-T-P: 0 -0 -5**

#### **COURSE OBJECTIVE:**

1. To create and develop basic programs.
2. To create and implement file concept.
3. Understand the concept of database connectivity.

**COURSE OUTCOME:** On the completion of the course the students will be able to

CO No.	CO Statement
CO1	Write, debug and execute simple Node.js programs.
CO2	Implement module in Node.js programs.
CO3	Add Function to module in node.js programs
CO4	Implement File concept in node.js.
CO5	Create Database connectivity in node.js.

#### **LIST OF PROGRAMS**

##### **Basic**

Write node.js program to create calculator module  
Write node.js program to add function to the module.

##### **File Handling**

Write node.js program to create, read from and write to a file

##### **Database connectivity**

Write node.js program to connect MySQL database and perform DDL,DML  
Commands

#### **TEXT BOOKS:**

- 1.Beginning Node.js 1st ed (December 2, 2014). Edition, Basarat Syed.
2. Node.js Web Development: Server-side web development made easy with Node 14 using practical examples, 5th Edition(2020),David Herron.
3. Web Development with Node and Express: Leveraging the JavaScript Stack 2nd Edition, Kindle Edition(2019), Ethan Brown.

4. Node.js Design Patterns: Master best practices to build modular and scalable server-side web applications, 2nd Edition 2nd Revised edition(2016), Mario Casciaro.
5. Node.js Design Patterns: Design and implement production-grade Node.js applications using proven patterns and techniques, 3rd Edition(2020),Mario Casciaro.

### **BOOKS FOR REFERENCE:**

1. Get Programming with Node.js 1st Edition(2019), Jonathan Wexler.
2. Beginning Node.js, Express & MongoDB Development Paperback – (September 1, 2020), Greg Lim.
3. Node Cookbook: Discover solutions, techniques, and best practices for server-side web development with Node.js 14, 4th Edition 4th ed. Edition(2020), Bethany Griggs.
4. Learning Node: Moving to the Server-Side 2nd Edition(2016), Shelley Powers.
5. Node.js in Practice 1st Edition(2015), Alex R. Young , Marc Harter.

### **E-LEARNING RESOURCES:**

<https://www.w3schools.com/nodejs/>  
<https://www.tutorialspoint.com/nodejs/index.htm>  
<https://www.javatpoint.com/nodejs-tutorial>  
<https://www.guru99.com/node-js-tutorial.html>  
<https://www.tutorialkart.com/nodejs/nodejs-tutorial/>

### **PEDAGOGY:**

Program Demo – White Board teaching, Power Point Presentation

### Mapping of CO with PSO:

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	1	3	3
<b>CO 3</b>	3	2	1	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	1.6	2.8	3



# ELECTIVES

## SEMESTER V

### RESOURCE MANAGEMENT TECHNIQUES

**TOTAL HOURS: 75**  
**CREDIT: 5**

**SUB CODE: 20UCAET5RM1**  
**L-T-P : 3 - 2 - 0**

#### COURSE OBJECTIVES:

- 1 .To impart knowledge in concepts and tools of Operations Research
2. To understand mathematical models used in Operations Research
3. To apply these techniques constructively to make effective business decision.

**COURSE OUTCOMES:** On the completion of the course the students will be able to

CO No.	CO Statement
CO 1	Define and formulate linear programming problems and appreciate their limitations
CO 2	Solve linear programming problems using appropriate techniques and optimization
CO 3	To Interpret the results obtained and translate solutions into directives for action
CO 4	To solve game theory problems
CO 5	Develop mathematical skills to analyse and solve network models

#### SYLLABUS

##### UNIT I :

**15 Hrs**

Basic of Operations Research (OR): Characteristics of O.R-Necessity of O.R in industry-OR and Decision making-Role of computers in O.R. Linear programming: Formulation and Graphical solution (of 2 variables) canonical and standard terms of Linear programming problem. Algebraic solution and Graphical solution: Simplex method

##### UNIT II:

**15 Hrs**

Transportation model: Definition-formulation and solution of transportation models – the row-minima, column-minima, matrix minima and vogel’s approximation methods. Assignment model: Definition of assignment model-comparison with transportation model-formulation and solution of Assignment model-variation of Assignment problem.

**UNIT III: 15 Hrs**

Sequencing problem: Processing each of n jobs through m machines-processing n jobs through 2 machines-processing n jobs through 3 machines – processing 2 jobs through m machines-processing n jobs through m machines – traveling salesman problem.

**UNIT IV: 15 Hrs**

Game Theory: Characteristic of games – maximin,minimax criteria of optimality – Dominance property – algebraic and graphical method of solution of solving 2\*2 games.

**UNIT V: 15 Hrs**

Pert-CPM: Networks-PERT computation-CPM computation – resource scheduling.

**TEXT BOOKS:**

1. P.R.Vittal,V.Malini ,Operations Research -Resource Management Technique, ,Margham Publication.
2. Srinath L.S.: PERT and CPM principles and applications, Affiliated East Press Pvt. Ltd., New York,
3. Dr. T.P.Singh ,Operations Research Book , , UDH PUBLISHERS & DISTRIBUTORS (P) LTD.
4. PK Gupta , D.S Hira , S Chand ,Operations Research ,
5. Kanthi Swarap, P.K.Gupta,Man Mohan,Operations Research—Introduction to Management Science,

**BOOKS FOR REFERENCE:**

1. S.K.JAIN,Operation Research ,, Galgotia Publication
2. J.K.Sharma ,Operation Research: Theory And Application,
3. Shoeb Ahmad ,Operations Research, NEW DELHI PUBLISHERS
4. Prof. V Sundaresan ,Operations Research,A R Publications (Publisher)
5. HamdyA.Taha:,(1996), Operation Research – An Introduction, 5thed. Prentice Hall of India, Private Limited.,New Delhi,.

## **E-LEARNING RESOURCES:**

1. <https://nptel.ac.in/courses/111/107/111107128/>
2. <https://examstime.in/operations-research-study-materials/>
3. <https://lecturenotes.in/subject/573/operations-research-or>
4. <https://www.darshan.ac.in/DIET/ME/SubjectDetail/2171901>
5. <https://examupdates.in/operation-research-notes/>

## **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

## **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## INTERNET OF THINGS

**TOTALHOURS: 75**  
**CREDIT: 5**

**SUB CODE: 20UCAET5IT1/: 20UCAET6IT2**  
**L-T-P : 3 - 2 - 0**

### **COURSE OBJECTIVES:**

1. To learn the concepts of IOT and its protocols.
2. To learn how to analysis the data in IOT.
3. To develop IOT infrastructure for popular applications.

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	To learn basic and introduction of IOT concepts
<b>CO 2</b>	To learn the fuctional of IOT and its protocols.
<b>CO 3</b>	To learn how to analysis the data in IOT.
<b>CO 4</b>	To develop IOT infrastructure for popular applications.
<b>CO 5</b>	To apply applications of IoT in real time scenario.

### **SYLLABUS**

#### **UNIT I**

**15 Hrs**

Introduction to IoT-Genesis of IoT-IoT and Digitization-IoT Impact-Convergence of IT and OT-IoT Challenges- IoT Network Architecture and Design-Drivers Behind New Network Architectures-Comparing IoT Architectures- Additional IoT Reference Models.

#### **UNIT II**

**15 Hrs**

The Core IoT Functional Stack- IoT Data Management and Compute Stack - Fog Computing- Edge Computing - The Hierarchy of Edge, Fog, and Cloud-Smart Objects- The Things in IoT- Sensors, Actuators, and Smart Objects- Sensor Networks-Wireless Sensor Networks- Communication Protocols for Wireless Sensor Networks.

#### **UNIT III**

**15 Hrs**

Connecting Smart Objects-Communications Criteria-IoT Access Technologies Standardization and Alliances- -Competitive Technologies- IEEE 802.15.4- IEEE 802.15.4g and 802.15.4e- IEEE 1901.2a- IEEE 802.11ah- LoRaWAN- NB-IoT and Other LTE Variations

**UNIT IV****15 Hrs**

IP as the IoT Network Layer- The Business Case for IP- Optimizing IP for IoT Authentication and Encryption on Constrained Nodes- ACE- DICE- Application Protocols for IoT- The Transport Layer- IoT Application Transport Methods- SCADA- Generic WebBased Protocols- IoT Application Layer Protocols- CoAP.

**UNIT V****15 Hrs**

IoT in Industry- Transportation- Transportation Challenges- IoT Use Cases for Transportation- An IoT Architecture for Transportation- Extending the Roadways IoT Architecture to Bus Mass Transit- Extending Bus IoT Architecture to Railways- Public Safety- Public and Private Partnership for Public Safety IoT- An IoT Blueprint for Public Safety Emergency Response IoT Architecture- School Bus Safety- School Bus Safety Network Architecture .

**TEXT BOOKS:**

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, (2017)—IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press
2. Kamal Kant Hiran Dr. Kamlesh Lakhwani, Dr. Hemant Kumar Gianey, Joseph Kofi Wireko, Internet of Things (IoT),
3. Hanes David , Salgueiro Gonzalo , Grossetete Patrick , Barton Rob ,Henry Jerome ,IoT Fundamentals | Networking Technologies, Protocols, and Use Cases for the Internet of Things ,First Edition , Pearson, by
4. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, 2nd Edition,
5. Samuel Greengard, The Internet of Things

**BOOKS FOR REFERENCE:**

1. Arshdeep Bahga, Vijay Madisetti, (2015) “Internet of Things – A hands-on approach”, Universities Press
2. Olivier Hersent, David Boswarthick, Omar Elloumi , (2012) —The Internet of Things – Key applications and Protocols, Wiley,
3. Jan Ho"ller, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, ( 2014) "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier,.
4. Honbo Zhou, ( 2012 ), “The Internet of Things in the Cloud: A Middleware Perspective”, CRC Press.

- Rahul Dubey, An Introduction to Internet of Things: Connecting Devices, Edge Gateway, and Cloud with Applications.

### **E-LEARNING RESOURCES:**

- [www.pubnub.com/blog/2015-05-27-internet-of-things-101-getting-started-w-raspberry-pi/](http://www.pubnub.com/blog/2015-05-27-internet-of-things-101-getting-started-w-raspberry-pi/)
- [www.theinternetofthings.eu/what-is-the-internet-of-things](http://www.theinternetofthings.eu/what-is-the-internet-of-things)
- [www.ibm.com/blogs/bluemix/2015/04/tutorial-using-a-raspberry-pi-python-iot-twiliobluemix/](http://www.ibm.com/blogs/bluemix/2015/04/tutorial-using-a-raspberry-pi-python-iot-twiliobluemix/)
- <https://www.guru99.com/iot-tutorial.html>
- [https://www.tutorialspoint.com/internet\\_of\\_things/internet\\_of\\_things\\_tutorial.pdf](https://www.tutorialspoint.com/internet_of_things/internet_of_things_tutorial.pdf)

### **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

### **Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

**SEMESTER VI**  
**ARTIFICIAL INTELLIGENCE**

**TOTALHOURS: 75**  
**CREDIT: 5**

**SUB CODE:20UCAET5AI1/ 20UCAET6AI2**  
**L-T-P : 3 - 2 - 0**

**COURSE OBJECTIVES:**

1. To learn the basic principles and techniques.
2. To learn applications of AI techniques.
3. To learn AI current scope and limitations.

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	To learn the basic principles and techniques of the artificial intelligence.
<b>CO 2</b>	To learn the basics of designing intelligent agents that can solve general purpose problems
<b>CO 3</b>	To Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
<b>CO 4</b>	To have fundamental understanding of various applications of AI techniques in intelligent agents.
<b>CO 5</b>	To learn AI current scope and limitations, and societal implications

**SYLLABUS**

**UNIT I** **15 Hrs**

What is AI- Foundations of AI- History of AI- State of AI- Intelligent Agent- Structure of agent- Environment

**UNIT II** **15 Hrs**

Problem formulation –toy problems, Real-world problems- uninformed search strategies – Breadth first search- Depth first search – uniform cost search- iterative deepening search- comparing search strategies

**UNIT III** **15 Hrs**

A \* search- heuristics – IDA\*- Hill climbing search- simulated annealing-alpha beta pruning – knowledge based agent

**UNIT IV** **15 Hrs**

propositional logic – inferences – first-order logic – inferences in first order logic – forward

chaining – backward chaining – unification – resolution

## **UNIT V**

**15 Hrs**

Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning.

### **TEXT BOOKS:**

1. S. Russel and P. Norvig, (2003 ),“Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education,.
2. Kevin Knight (Author), Elaine Rich ,Artificial Intelligence, Third Edition
3. Philip C. Jackson, Introduction to Artificial Intelligence, , Dover Publications
4. Naresh & Sunil Kumar ,Artificial Intelligence,
5. Richard E. Neapolitan,Xia Jiang,,Artificial Intelligence With an Introduction to Machine Learning, Second Edition,

### **BOOKS FOR REFERENCE:**

1. David Poole, Alan Mackworth, Randy Goebel,(2004),”Computational Intelligence: a Logicalapproach”, Oxford University Press.
2. G. Luger, (2002),“Artificial Intelligence: Structures and Strategies for complex problem solving”, Fourth Edition, Pearson Education,.
3. Chandra S.S.V.,Artificial Intelligence and Machine Learning
4. Tom Taulli,Artificial Intelligence Basics: A Non-Technical Introduction,
5. Deepak Khemani ,A First Course in Artificial Intelligence

### **E-LEARNING RESOURCES:**

1. <https://eecs.wsu.edu/~cook/ai/lectures/p.html>
2. [http://www.brainkart.com/subject/Artificial-Intelligence\\_144/](http://www.brainkart.com/subject/Artificial-Intelligence_144/)
3. [https://epub.uni-regensburg.de/13629/1/ubr06078\\_ocr.pdf](https://epub.uni-regensburg.de/13629/1/ubr06078_ocr.pdf)
4. <https://cse.iitk.ac.in/users/cs365/2013/materials.html>
5. [http://zsi.tech.us.edu.pl/~nowak/bien/BIEN\\_introduction.pdf](http://zsi.tech.us.edu.pl/~nowak/bien/BIEN_introduction.pdf)

### **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)



### Mapping of CO with PSO:

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## SECURITY IN INFORMATION TECHNOLOGY

**TOTALHOURS: 75**  
**CREDIT: 5**

**SUB CODE: 20UCAET5ST1/20UCAET6ST2**  
**L-T-P : 3 - 2 - 0**

### **COURSE OBJECTIVES:**

1. To understand the need of Security.
2. To learn about risk management and security policies.
3. To learn cryptography and security maintenance

**COURSE OUTCOME:** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	To understand the need of Security.
<b>CO 2</b>	To learn about risk management and security policies.
<b>CO 3</b>	To learn Intrusion Detection and Firewall Protection
<b>CO 4</b>	To learn cryptography and Steganography.
<b>CO 5</b>	Introduction, security management models, maintenance model.

## **SYLLABUS**

### **UNIT I**

**15 Hrs**

**Information Security** – Introduction of information security – History, critical characteristic of Information, NSTISSC Security model, Components of an information system, securing components. **The need for security** – Introduction, Business needs, Treats, Attacks, Malicious code, Hoaxes, Back doors, Password crack, Brute force, Dictionary, DoS, Spoofing, Man-in-the-middle, Spam, Mail Bombing, Sniffers, Social Engineering, Buffer Overflow, Timing Attack.

### **UNIT II**

**15 Hrs**

**Risk Management** – Introduction, overview of risk management, risk identification, risk assessment, risk control strategies, selecting a risk control strategy. **Security Policies** – Introduction, information security policy, standards and practices, information security blueprint, continuity strategies, introduction to ISO27000 series.

### **UNIT III**

**15 Hrs**

**Firewall and VPNs** - Introduction, Physical design, Firewalls, protecting remote connections.

**Intrusion Detection, Access control and other tools** – Introduction, IDSs, Honey nets and Padded cell systems, Scanning and Analysis tools, Access control devices.

#### **UNIT IV**

**15 Hrs**

**Cryptography** – Introduction, Principles of Cryptography, Cryptography tools, Public key infrastructure, Digital certificates, Hybrid cryptography systems, Steganography, protocols for secure communication.

#### **UNIT V**

**15 Hrs**

**Information Security Maintenance** – Introduction, security management models, maintenance model.

#### **TEXT BOOKS:**

1. Michael E. Whitman and Herbert J. Mattord, Principles of Information Security, 4<sup>th</sup> Edition, Thomson Course Technology, Boston.
2. Fundamentals of Information Systems Security David Kim and Michael G. Solomon
3. Cybersecurity Essentials, Philip Craig, Donald Short, Christopher Grow, Charles J. Brooks.
4. Information Security: Principles and Practice, Mark Stamp.
5. The Hacker and the State: Cyber Attacks and the New Normal of Geopolitics, Ben Buchanan

#### **BOOKS FOR REFERENCE:**

1. Daswani Neil, Christopher Kern and Anita Kesavan, (2007), Foundations of Security – What every programmer needs to know, Apress, Berkeley CA.
2. Michael Howard and Steve Lipner, The Security Development Lifecycle: SDL, a Process for Developing Demonstrably.
3. Harold F. Tipton, Handbook of Information Security Management,.
4. Mike Speciner and Radia Perlman, Network Security: Private Communication in a Public World,
5. D. Brent Chapman, Building Internet Firewalls.

#### **E-LEARNING RESOURCES:**

1. <https://www.cisco.com/c/en/us/products/security/what-is-it-security.html>
2. <https://vitbhopal.ac.in/cyberstudy-materials>
3. [https://www.vssut.ac.in/lecture\\_notes/lecture1423183198.pdf](https://www.vssut.ac.in/lecture_notes/lecture1423183198.pdf)
4. <https://www.coursera.org/learn/information-security-data>
5. <https://www.sans.org/it-security>

**PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## COMPUTER GRAPHICS

**TOTALHOURS: 75**  
**CREDIT: 5**

**SUB CODE: 20UCAET5CG1/20UCAET6CG2**  
**L-T-P : 3 - 2 – 0**

### COURSE OBJECTIVES:

1. To understand the fundamentals of computer graphics.
2. To learn about line drawing algorithms
3. To learn two and three dimensional concepts.

**COURSE OUTCOME:** On the completion of the course the students will be able to

CO No.	CO Statement
CO 1	To understand the fundamentals of computer graphics.
CO 2	To learn about line drawing algorithms.
CO 3	To learn transformations and viewing
CO 4	To understand three dimensional concepts.
CO 5	To apply the concepts Parallel Projection, Perspective Projection.

## SYLLABUS

### UNIT I

**15 Hrs**

Introduction to computer graphics: Brief Survey of Computer Graphics – Graphics Systems: Video Display Devices – Types – Raster-Scan Systems and Random-Scan Systems – Input Devices – Hard-Copy Devices – Graphics Software.

### UNIT II

**15 Hrs**

Output primitives and their attributes Line-Drawing (DDA and Bresenham's) Algorithms – Circle-Generating (Midpoint) Algorithm – Ellipse-Generating (Midpoint) Algorithms- Area-Filling (Boundary-Fill and Flood-Fill) Algorithms - Line Attributes - Color and Grayscale Levels – Character Attributes.

### UNIT III

**15 Hrs**

Two-dimensional transformations and viewing : Basic Transformations - Matrix Representations and Homogeneous Coordinates – Composite Transformations - Other Transformations – Window-to- Viewport Coordinate Transformation.

**UNIT IV****15 Hrs**

Three-dimensional concepts: Three-Dimensional Display Methods: Parallel and Perspective Projections – Depth Cueing - Visible Line and Surface Identification – Three-Dimensional Transformations: Translation- Rotation- Scaling - Other Transformations.

**UNIT V****15 Hrs**

Three-dimensional viewing: Viewing Pipeline and Coordinates – Transformation from World to Viewing Coordinates – Projections – Parallel Projection- Perspective Projection.

**TEXT BOOKS:**

1. Hearn and M.P. Baker,2005,Computer Graphics, 2ndEdition, Pearson Education, Prentice Hall, 19th Reprint.
2. Mukundan, Ramakrishnan ,Advanced Methods in Computer Graphics
3. Fabio Ganovelli ,Massimiliano Corsini , Sumanta Pattanaik , Marco Di Benedetto,
4. Introduction to Computer Graphics: A Practical Learning Approach 1st Edition,
5. Klawonn, Frank,,Introduction to Computer Graphics,Using Java 2D and 3D
6. Rajiv Chopra,Computer Graphics , S.Chand

**BOOKS FOR REFERENCE:**

1. S. Harrington,(1987), Computer Graphics , 2nd Edition , Tata McGraw-Hill Book Co.
2. W.M. Newman and R.F. Sproull ,(1997), Principles of Interactive Computer Graphics, 2nd Edition, Tata McGraw-Hill Publishing Co. Ltd.
3. D.P. Mukherjee, (1999),Fundamentals of Computer Graphics and Multimedia , 1<sup>st</sup> Edition, Prentice-Hall of India Pvt. Ltd.
4. P K Singh & Rajendra Kumar, Computer Graphics (GBTU).
5. Nobuhiko Mukai ,Computer Graphics.

**E-LEARNING RESOURCES:**

1. <https://www.aminotes.com/2017/07/computer-graphics-notes.html>
2. <https://www.aminotes.com/2017/07/computer-graphics-notes.html>
3. <https://www.geektonight.com/computer-graphics-notes/>
4. <https://lecturenotes.in/subject/59/computer-graphics-cg>
5. <https://www.ncertbooks.guru/computer-graphics-notes/>

**PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## DATA MINING

**TOTALHOURS: 75**

**SUB CODE: 20UCAET5DM1/20UCAET6DM2**

**CREDIT: 5**

**L-T-P : 3 - 2 - 0**

### **COURSE OBJECTIVES:**

1. To understand the basics of data mining.
2. To learn about data mining techniques,
3. To learn about classification algorithms.

**COURSE OUTCOME :** On the completion of the course the students will be able to

<b>CO No.</b>	<b>CO Statement</b>
<b>CO 1</b>	To understand the basics of data mining.
<b>CO 2</b>	To apply data preprocessing concepts.
<b>CO 3</b>	To learn Data mining techniques.
<b>CO 4</b>	To learn about classification algorithms.
<b>CO 5</b>	To analysis the clustering techniques.

## **SYLLABUS**

### **UNIT I**

**15 Hrs**

Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases - Mining Issues – Metrics – Social implications of Data mining. Data Mining Techniques – Introduction – A statistical perspective on Data Mining – similarity measures – Decision Trees – Neural Networks – Genetic Algorithms

### **UNIT II**

**15 Hrs**

Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization .

### **UNIT III**

**15 Hrs**

Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining



## **UNIT IV**

**15 Hrs**

Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy

## **UNIT V**

**15 Hrs**

Clustering Techniques: cluster Analysis – Clustering Methods – Similarity and Distance Measures – Hierarchical Methods - Partitional Methods – Outlier Analysis

### **TEXT BOOKS:**

1. Han and M. Kamber , (2001), “Data Mining: Concepts and Techniques”, Morgan Kaufmann, .New Delhi.
2. Pang-Ning Tan, and Vipin Kumar ,Introduction to Data Mining, Michael Steinbach.
3. Mohammed J. Zaki ,Data Mining and Analysis: Fundamental Concepts and Algorithms
4. Ian H. Witten, Eibe Frank, Christopher J. Pal, Mark A. Hall,Data Mining: Practical Machine Learning Tools and Techniques
5. David J. Hand, Heikki Mannila, and Padhraic Smyth ,Principles of Data Mining

### **BOOKS FOR REFERENCE:**

1. M. H.Dunham, (2003), “Data Mining : Introductory and Advanced Topics” , Pearson Education, Delhi.
2. PaulrajPonnaiah, (2001), ”Data Warehousing Fundamentals“, Wiley Publishers
3. S.N. Sivananda and S. Sumathi, (2006), Data Mining, Thomsan Learning, Chennai
4. M. A. Bramer and Max Bramer ,Principles of Data Mining
5. Nitu Sharma, (2013), Data Warehouse and Data Mining

### **E-LEARNING RESOURCES:**

1. <http://nptel.iitm.ac.in/video.php?subjectId=106106093>
2. <http://cecs.louisville.edu/datamining/PDF/0471228524.pdf>
3. <https://examupdates.in/data-mining-lecture-notes>
4. <https://ocw.mit.edu/courses/sloan-school-of-management/15-062-data-mining-spring-2003/lecture-notes>
5. <https://www.ngdata.com/data-mining-resources>

### **PEDAGOGY:**

Lecture -Black Board Teaching, Power Point Presentation, Exercises (Individual)

**Mapping of CO with PSO:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	3	2	2	3	3
<b>CO 2</b>	3	2	2	3	3
<b>CO 3</b>	3	2	2	2	3
<b>CO 4</b>	3	2	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>Average</b>	3	2	2	2.8	3

## QUESTION PAPER PATTERN END SEMESTER EXAMINATION

<b>Knowledge Level</b>	<b>Section</b>	<b>Word Limit</b>	<b>Marks</b>	<b>Total</b>	<b>Special Instructions if any</b>

**Shrimathi DevkunvarNanalal Bhatt Vaishnav College for Women**  
**(Autonomous)**  
**Re-accredited with “A+” Grade by NAAC**

**Amendments in the regulations from 2020 – 2021 onwards**

**UG -**

**Changes in Part-IV**

**Semester – I**

<b>Title</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Credits</b>
Soft Skills – Essentials of Communication Skills	50	-	3
Environmental Studies – For Day Students	50	-	2

**Semester – II**

<b>Title</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Credits</b>
Soft Skills – Essentials of Spoken and Presentation Skills	50	-	3
Environmental Studies – For Self-Supporting Students	50	-	2
<b>Yoga and wellness</b>	<b>50</b>	-	<b>2</b>

**Semester – III**

<b>Title</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Credits</b>
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NME – Offered to other department students	50	-	2
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Semester – IV

<b>Title</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Credits</b>
NME – Offered to other department students	50	-	2

Semester – V

<b>Title</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Credits</b>
<b>Skill Enhancement course</b>	<b>50</b>	<b>-</b>	<b>3</b>

Semester – VI

<b>Title</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Credits</b>
<b>Skill based Elective</b> – Offered to students of same department SWAYAM – MOOC or other (For Non-Commerce Students) ArthaVidhya (For Commerce Students)	50	-	3