KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2025 – 2026 onwards)

DEPARTMENT OF COMPUTER APPLICATIONS(UG)

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

Vision

Developing the total personality of every student in a holistic way by adhering to the principles of Swami Vivekananda and Mahatma Gandhi.

Mission

- Imparting holistic and man-making education with emphasis on character, culture and value - moral and ethical.
- Designing the curriculum and offering courses that transform its students into value added skilled human resources.
- Constantly updating academic and management practices towards total quality management and promotion of quality in all spheres.
- Extending the best student support services by making them comprehensive and by evolving a curriculum relevant to student community and society at large.
- Taking steps to make education affordable and accessible by extending scholarships to the meritorious and economically disadvantaged students.
- Molding the teachers in such a way that they become the role models in promoting Higher Education.

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

DEPARTMENT OF COMPUTER APPLICATIONS

Vision:

- Our vision is to offer up to date and flexible programs which will allow our graduates to be competitive in the job market.
- To achieve excellent standards of quality education by keeping pace with rapidly changing technologies.
- Integral Formation and Empowerment of students for social transformation through Computer Applications.

Mission:

- To provide outstanding education and training to our graduate students for their productive careers in industry, academia, and government.
- To impart quality and value-based education to raise satisfaction level of all stakeholders.
- To empower students with academic excellence, knowledge and training.
- To enable critical thinking among students towards development in IT with reference to social transformation.
- To apply new developments in Information Management and provide all possible support to promote research & development.
- To serve as a platform whereby the student enrich their personalities to assume greater responsibilities.

PROGRAMME OUTCOME (PO)

PO1 To enhance their skills and new computing technologies through practical and theoretical knowledge of Computer.

PO2 To exhibit understanding of broad business concepts and principles.

PO3 To expertise students as computing professionals to earn more and to contribute to the economic development of the region, state and nation.

PO4 To analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.

PO5 To develop various real time applications using latest technologies and programming languages.

PO6 To pursue higher education to enhance their skill and capable of recognizing and resolving ethical issues.

PO7 To demonstrate the capabilities required to apply cross-functional business knowledge and technologies in solving real-world business problems.

PO8 To blend analytical, logical and managerial skills with the technical aspects to resolve real world issues.

PROGRAMME SPECIFIC OUTCOME (PSO)

PS01 An ability to apply knowledge of computing and mathematics appropriate to the discipline.

PS02 An ability to apply current techniques, skills, and tools necessary for computing practice and to integrate IT-based solutions into the user environment effectively.

PS03 An ability to apply design and development principles in the construction of software systems of varying complexity.

PS04 An ability to use knowledge in various domains to identify real world problems and hence to provide solution to new ideas and innovations.

PS05 An ability to design, document and develop robust applications by considering human, financial and environmental factors using cutting edge technologies to address individual and organizational needs.

UCA 1

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE – 641 029

Course Name: Computer Applications

Curriculum and Scheme of Examination under CBCS

(Applicable to the students admitted during the Academic Year 2025 - 2026)

Semester	Part	Subject Code	Title of the Paper	Instruction hour /Cycle	Exam. Marks			Duration of Exam (Hours)	Credits
					CIA	ESE	TOTAL		
I	I	25TML101	Language - I@	6	25	75	100	3	3
	II	25ENG101	English - I	6	25	75	100	3	3
	III	25UCA101	Core Paper 1 - C Programming	5	25	75	100	3	4
	III	25UCA1CL	Core Practical 1 – C Programming Lab	5	40	60	100	3	4
	III	25UCA1A1	Allied Paper 1 – Business Accounting	6	25	75	100	3	5
	IV	25EVS101	Environmental Studies **	2	-	50	50	3	2
	Total			**30**	**-**	**-**	**550**	**-**	**21**
	I	25TML202	Language II@	6	25	75	100	3	3
	II	25ENG202	English – II	6	25	75	100	3	3
	III	25UCA202	Core Paper 2 - Object Oriented Programming with Java	5	25	75	100	3	4
	III	25UCA2CM	Core Practical 2 - Object Oriented Programming with Java Lab	5	40	60	100	3	4
	III	25UCA2A2	Allied Paper 2 – Mathematics I Computer Oriented Numerical and Statistics	6	25	75	100	3	5
	IV	25VED201	Value Education - Moral and Ethics**	2	-	50	50	3	2
	Total			**30**	**-**	**-**	**550**	**-**	**21**
III	I	25TML303	Language -III@	6	25	75	100	3	3
	II	25ENG303	English - III	6	25	75	100	3	3
	III	25UCA303	Core Paper 3 – RDBMS	4	25	75	100	3	3
	III	25UCA3CN	Core Practical 3 – RDBMS Lab	4	40	60	100	3	4
	III	25UCA3A3	Allied Paper 3 – Mathematics II Operations Research	6	25	75	100	3	5
	III	25UGC3S1	Skill Based Subject 1- Cyber Security	2	100	-	100	3	3
	IV	25TBT301/ 25TAT301/ 25UHR3N1	Basic Tamil* / Advanced Tamil**/ Non-major elective - I**	2	-	75	75	3	2
	Total			**30**	**-**	**-**	**675**	**-**	**23**

UCA 2

Semester	Part	Subject Code	Title of the Paper	Instruction hour /Cycle	Exam. Marks			Duration of Exam (Hours)	Credits
					CIA	ESE	TOTAL		
IV	I	25TML404	Language - IV@	6	25	75	100	3	3
	II	25ENG404	English -IV	6	25	75	100	3	3
	III	25UCA404	Core Paper 4 -Python Programming	4	25	75	100	3	3
	III	25UCA4CO	Core Practical 4 – Data Structure using Python Lab	4	40	60	100	3	4
	III	25UCA4A4	Allied Paper 4 – Data Structures	6	25	75	100	3	5
	III	25UCA4SL	Skill Based Subject 2: Professional Development Lab	2	40	60	100	3	3
	IV	25TBT402/ 25TAT402/ 25UHR4N2	Basic Tamil* / Advanced Tamil**/ Non-major elective- II**	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**23**
V	III	25UCA505	Core Paper 5 – Software Engineering	6	25	75	100	3	4
	III	25UCA506	Core Paper 6 - Operating Systems	5	25	75	100	3	4
	III	25UCA507	Core Paper 7 - Artificial Intelligence and Machine Learning	6	25	75	100	3	4
	III	25UCA5CP	Core Practical 5 - Artificial Intelligence and Machine Learning Lab	6	40	60	100	3	3
	III	25UCA5E1	Major Elective I	5	25	75	100	3	5
	IV	-	Extra Departmental Course	2	100	-	100	3	3
	-	25UCA5IT	Internship Training ****	**Grade**					
			Total	**30**	**-**	**-**	**600**	**-**	**23**
VI	III	25UCA608	Core Paper 8 - Data Science with R Programming	5	25	75	100	3	4
	III	25UCA6CQ	Core Practical 6 – Data Science with R Programming Lab	5	40	60	100	3	4
	III	25UCA6CR	Core Practical 7- Web Designing Lab	4	40	60	100	3	3
	III	25UCA609	Core Paper 9- Computer Networks	5	25	75	100	3	4
	III	25UCA6E2	Major Elective 2	5	25	75	100	3	5
	III	25UCA6Z1	Project and Viva Voce***	4	20	80	100	-	5
	IV	25UBI6S3	Skill Based subject 3- Basics of IPR	2	100	-	100	3	3
	Total			**30**	**-**	**-**	**700**	**-**	**28**
	V	25NCC $/NSS/YRC/ PYE/ECC/ RRC/WEC101#	Co-curricular Activities*	-	50	-	50	-	1
	Grand Total			**-**	**-**	**-**	**3800**	**-**	**140**

UCA 3

Note :

CBCS – Choice Based Credit system, CIA– Continuous Internal Assessment, ESE– End of Semester Examinations

$ For those students who opt NCC under Cocurricular activities will be studying the prescribed syllabi of the UGC which will include Theory, Practical & Camp components. Such students who qualify the prescribed requirements will earn an additional 24 credits.

@ Hindi/Malayalam/ French/ Sanskrit – 25HIN/MLM/FRN/SAN101 - 404

***** - No End-of-Semester Examinations. Only Continuous Internal Assessment (CIA)

******- No Continuous Internal Assessment (CIA). Only End-of-Semester Examinations (ESE)

*** Project Report – 60 marks; Viva voce – 20 marks; Internal-20 marks. 4 hours allotted for project Will not be allocated for staff workload.

**** The students shall undergo Internship training / field work for a minimum period of 14 working days at the end of the fourth semester during summer vacation and submit the report in the fifth semester which will be evaluated for 100 marks by the concerned guide and followed by an Internal Viva voce by the respective faculty or HOD as decided by the department. According to their marks, the grades will be awarded as given below.

Marks %	Grade
85 – 100	O
70 – 84	D
60 – 69	A
50 – 59	B
40 – 49	C
< 40	U (Reappear)

Major Elective Papers (2 papers are to be chosen from the following 6 papers)

1) Big Data and Analytics
2) Datamining and Warehousing
3) Cloud Computing
4) Internet of Things (IoT)
5) Block Chain
6) Software Project Management

UCA 4

Non-Major Elective Papers

1. Human Rights
2. Women's Rights
3. Consumer Affairs

Sub. Code & Title of the Extra Departmental Course (EDC) :

25UCA5XL – Internet and Office Automation

 # List of Cocurricular Activities:

1. National Cadet Corps (NCC)
2. National Service Scheme (NSS)
3. Youth Red Cross (YRC)
4. Physical Education (PYE)
5. Eco Club (ECC)
6. Red Ribbon Club (RRC)
7. Women Empowerment Cell (WEC)

Job Oriented Courses (JOC)

JOC – 1 – Open Source Designing Tools Lab
JOC – 2 – IoT Simulation Tools Lab
JOC – 3 - Data Visualization Lab
JOC – 4 - Mobile App Development using Open Source Tools

Note: In core/ allied subjects, no. of papers both theory and practical are included wherever applicable. However, the total credits and marks for core/allied subjects remain the same as stated below.

UCA 5

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil/Hindi/Malayalam/ French/ Sanskrit	400	12
2.	II	English	400	12
3.	III	Core – Theory/Practical	1600	60
	III	Allied	400	20
		Electives/Project	300	15
4.	IV	Basic Tamil / Advanced Tamil (OR) Non-major electives	150	4
		Skill Based subject	300	9
		EDC	100	3
		Environmental Studies	50	2
		Value Education	50	2
5.	V	Cocurricular Activities	50	1
		Total	**3800**	**140**

- 25 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra credit courses.

- 100 % CIA for Cyber Security, EDC and Basics of IPR.

- The students should complete **Health and Wellness Programme (25UHW401)**[###] in the 4th semester and the completion marks should be submitted through the HOD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.

- The students should complete any **MOOC course available for Online learning platforms like SWAYAM, NPTEL, Course era[$$], IIT Bombay Spoken Tutorial, e-Pathshala etc.,** with a minimum of 4 weeks in duration before the completion of the 5th semester and the course completion certificate should be submitted through the HOD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.

[$$]**Note:** One course to be taken from course era for all the under graduate students of self-finance stream during the even semester of the I year. Appropriate extra credits and certification as applicable shall be awarded to the students who have completed the course.

UCA 6

- An **Onsite Training** preferably relevant to the course may be undertaken as per the discretion of the HOD.

- Students who successfully complete **Naan Mudhalvan** courses in 3rd and 5th semester will be given 2 extra credits for each course. They are asked to submit the marks to Controller of Examinations through and undersigned by the HOD.

Semester	Naan Mudhalvan Course Title
III	Digital Marketing
V	Employability Skills

Components of Continuous Internal Assessment

Components		**Marks**	**Total**
Theory			
CIA I	75	(75+75 = 150/10) 15	25
CIA II	75		
Assignment/Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	
Project			
Review		15	20
Regularity		5	
Theory (Allied) (External : 55 marks)			
CIA I	55	(55+55) Converted to 10	20
CIA II	55		
Assignment/Seminar		5	
Attendance		5	
Practical (Allied) (External : 30 marks)			
CIA Practical		10	20
Observation Notebook		5	
Attendance		5	

UCA 7

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remembering; **K2**-Understanding; **K3**-Applying; **K4**-Analyzing; **K5**-Evaluating

1. ESE Theory Examination:

(i) CIA I & II and ESE: 75 Marks

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	75
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

(ii) CIA I & II and ESE: 55 Marks (Allied)

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	55
K2 – K4 Q11 to 15	B (Either or pattern)	5 x 3 = 15	Short Answers	
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 6 = 30	Descriptive / Detailed	

2. ESE Practical Examination:

Knowledge Level	Section	Marks	Total
K3	Experiments	50	60
K4	Record Work	10	
K5			

(For Allied papers)			
Knowledge Level	Section	Marks	Total
K3	Experiments	25	30
K4	Record Work	05	
K5			

3. ESE Project Viva Voce:

Knowledge Level	Section	Marks	Total
K3	Project Report	60	80
K4	Viva voce	20	
K5			

Scheme of Evaluation - Health and Wellness Programme (25UHW401)###

Part	**Description**	**Mark**
A	Report	40
B	Attendance	20
C	Activities (Observation during Practice)	40
Total		**100**

UCA 9

Sub. Code: 25UCA101

Programme Code:10		**Bachelor of Computer Applications**		
Title of the Paper		**Core Paper 1 – C Programming**		
Batch **2025 - 2028**	**Hours** **Week** **5**	**Total** **Hours** **75**	**Credits** **4**	**Skill Development**

Course Objectives

1. To train the student to the basic concepts of the C-programming language.
2. To provide exposure to problem-solving through programming and to develop programming skills.
3. To learn and apply key programming constructs such as variables, constants, data types, operators and control structures.
4. To impart adequate knowledge of programming languages and problem-solving techniques.
5. To design and implement data structures like structures and unions to build real-world applications in C.

Course Outcomes (CO)

K1 to K5	CO1	Developing programs using the control statements, Arrays and Strings.
	CO2	Understanding about the code reusability with the help of user defined functions.
	CO3	Developing programs using pointer, enumerated data types, function, Union and nested structures.
	CO4	Learning the file handling mechanism that is essential for storing and accessing data.
	CO5	Determine efficient techniques in programming to solve various real time problems.

Syllabus

UNIT I (14 Hours)

Overview of C: History of C – Importance of C- Sample programs – Basic Structure of C programs – Programming style. Constants, Variables and Data types: Character set – C Tokens – Keywords and Identifiers – Constants – Variables – Data types.

UCA 10

Sub. Code: 25UCA101

Operators and Expressions: Introduction – Arithmetic operator – Relational operators – Logical operators -Assignment-Increment and Decrement-Conditional– Bitwise operators -Special Operators – Type conversions in Expressions – Operator precedence and Associativity. Managing Input and Output operations: Reading and Writing Character-Formatted Input – Formatted Output.

UNIT II **(15 Hours)**

Decision making and Branching: Decision making with if statement – Simple if statement – The If else statement-Nested If-Else-If Ladder – The Switch statement-The Ternary Operator. Looping: The while statement – The do statement – The for statement – **Jumps in loops*.**

UNIT III **(16 Hours)**

Arrays: Introduction – one dimensional Arrays – Declaration of one-dimensional Array – Initialization of one-dimensional Arrays – Two dimensional Arrays – Initializing Two dimensional Arrays – Multidimensional Arrays. Character Arrays and Strings: String handling functions. User defined functions: Definition of Functions – Function Declaration – Category of Functions – No Arguments and No Return values – Arguments but No Return values – Arguments with Return values – No Arguments but Returns a value - Functions that Return Multiple Values- Recursion – The Scope, Visibility and Lifetime of Variables.

UNIT IV **(16 Hours)**

Pointers: Understanding pointers –Accessing the Address of the Variables- Declaring pointer variables – Pointer and Arrays- Pointers and Character strings – Array of pointers – Pointers as Function Arguments- Functions returning pointers. The Pre-processor: Macro Substitution.

UNIT V **(14 Hours)**

Structures and Unions: Introduction – Defining a Structure – Declaring Structure variables – Structure Initialization –Array of Structures-Arrays with in Structures-Structures with in Structures– Unions. File Management in C: Defining and Opening a File – Closing a File – Input/output Operations on Files – Command Line Arguments.

UCA 11

Sub. Code: 25UCA101

*** Self-study and questions for examinations may be taken from the self-study portions also**

Teaching Methods

Smart classroom / PowerPoint presentation / Seminar / Quiz / Discussion

Text Books

1. E. Balagurusamy, (2024), **"Programming in ANSI C",** 9th Edition -Tata McGraw Hill.

Reference Books

1. Ashok N Kamthane, (2007), **"Programming with ANSI and Turbo C",** Pearson

Education Publication.

2. P.J.Deiteland H.M.Deitel, (2008**), "C How to Program",** 5th Edition, Tata McGraw Hill.

3. Yeswanth Kanethkar, (2007),**"Let Us C"**, Eigth Edition - BTB Publications.

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	M	S	S
CO2	S	S	H	H	S
CO3	H	H	S	M	H
CO4	S	H	M	S	H
CO5	S	S	S	S	S

S – Strong **H** – High M – Medium **L** – Low

UCA 12

Sub. Code: 25UCA1CL

Programme Code:10		Bachelor of Computer Applications		
Title of the Paper		Core Practical 1 – C Programming Lab		
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. To introduce C Programming concepts to develop the programming knowledge.
2. To enhance their analysing and problem-solving skills and use the same for writing programs in C.
3. To guide the candidates to explore the fundamental building blocks in the programming language.
4. To improve students' problem-solving and analytical skills through hands-on exercises.
5. To help students understand the importance of modular programming by writing functions for various tasks.

Course Outcomes (CO)

K3 to K5	CO1	Developing programs using the control statements, Arrays and Strings.
	CO2	Understanding about the code reusability with the help of user defined functions.
	CO3	Developing programs using pointer, enumerated data types, function, Union and nested structures.
	CO4	Learning the file handling mechanism that is essential for storing and accessing data.
	CO5	Determine efficient techniques in programming to solve various real time problems.

LIST OF PRACTICAL PROGRAMS

1. Write a C program to find the median for a given set of numbers.
2. Write a C program to find the Standard Deviation for a given set of numbers.
3. Write a C program to find the number of palindrome strings in a given sentence.
4. Write a C program to generate N Prime and Armstrong numbers.
5. Write a C program to perform Matrix addition & Multiplication using Arrays.
6. Write a C program to calculate NCR using the formula NCR = N! / (R! * (N-R)!) Using functions.

UCA 13

Sub. Code: 25UCA1CL

7. Write a C programto print Fibonacci Series using Recursive Function.
8. Write a C program to print the student's mark sheet assuming roll number, name, and marks in five subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.
9. Write a C program to find the union of two arrays (sets).
10. Write a C program to perform all manipulations like insertion, deletion and modification in files for student mark list.
11. Write a C program to perform string manipulation operations.
12. Write a program, which takes a file as command line argument and copy it to another file. At the end of the second file write
    - I. Number of characters,
    - II. Number of words and
    - III. Numbers of lines are available in the first file.

Teaching Methods:

Smart Classroom, Projectors, Discussions

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work – 10 Marks.
2. Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

UCA 14

Sub. Code: 25UCA1CL

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	M
CO2	S	S	M	H	H
CO3	S	H	H	S	M
CO4	H	S	M	H	M
CO5	S	S	S	H	H

S – Strong **H** – High **M** – Medium **L** – Low

UCA 15

Sub. Code: 25UCA202

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Paper 2 – Object Oriented Programming with Java**			
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. To obtain the basic knowledge of Object-Oriented Programming using the core Java programming language.
2. To understand the fundamentals of Constructors, and Method Overloading
3. To acquire the working principles of Arrays and Error handling mechanisms in Java.
4. To inculcate the principles of Interfaces and Packages
5. To implement the Applets and Graphics Programming in Java.

Course Outcomes (CO)

K1 to K5	CO1	Acquiring knowledge of Object-Oriented Programming using Java programming language
	CO2	Understanding and applying concepts of Arrays, Constructor and Overloading.
	CO3	Analyzing the concepts of Exception handling mechanisms in Java.
	CO4	Implementing Graphical User Interface using Applets, AWT & Swing Components.
	CO5	Evaluating the Java concepts with threads and I/O streams with relevant case studies.

Syllabus

UNIT I **(Hours 15)**

Fundamentals of Object-Oriented Programming: Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. Java Evolution: History – Features – Java and Internet – Java and www –Web Browsers- Java Environment. Overview of Java: Simple Java program – Java program structure – Java Tokens – Java Statements – Implementing Java Programs - Java Virtual Machine.

UCA 16

Sub.Code:25UCA202

UNIT II **(Hours 15)**

Constants – Variables - Data Types –Declaration of variables - Scope of variables – Giving and Getting of Variables - Type Casting - Operators and Expressions – Decision Making and Branching: if, if...else, nested if, switch ?: Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops.

UNIT III **(Hours 15)**

Classes, Objects and Methods - Arrays, Strings and Vectors: Creation – One dimensional Array – Two-dimensional Array– Strings – Vectors – Wrapper Class – Enumerated Types - Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

UNIT IV **(Hours 15)**

Managing Errors and Exceptions: Types of Errors- Compile-time and Runtime Errors – Exceptions – Using Finally Statements – Applet Programming – Graphics Programming.

UNIT V **(Hours 15)**

Managing Input / Output Files in Java: Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive Data Types – Concatenating and Buffering Files Random Access Files. *****

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Teaching Methods

Projectors, Seminar, Discussions

Text Books:

1.E.Balagurusamy, **"Programming with Java**", McGrawHill Publication, 6th Edition, 2019.

Reference Books:

1. Patrick Naughton& Hebert Schildt, **The Complete Reference Java 2**, 3rd Edition, TMH.
2. John R. Hubbard, **Programming with Java** ,2nd Edition, TMH.

UCA 17

Sub.Code:25UCA202

MAPPING

PSO / CO	PSO1	PSO2	PS3	PSO4	PSO5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	H	S	M	H	S
CO4	S	M	S	M	H
CO5	S	H	S	S	H

S–Strong **H**–High **M** – Medium **L**–Low

UCA 18

Sub.Code:25UCA2CM

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Practical 2 – Object Oriented Programming with Java Lab**			
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. To understand the Object Oriented principles of Java Programming.
2. To understand the Applications of Java Programming.
3. To apply the functions of Java programming.
4. To apply the principle of Java and basic fundamentals of Networking.
5. To analyze the techniques followed in this practical paper.

Course Outcomes (CO)

K3toK5	CO1	Designing the basic concepts of Object-Oriented Programming in Java Programming.
	CO2	Implementing arrays, constructor and exception handling mechanism using Java.
	CO3	Validating the basic networking operations using Java.
	CO4	Implementing Graphical User Interface using Applets, AWT & Swing Component.
	CO5	Evaluate the Java concepts with threads and I/O streams

LIST OF PRACTICAL PROGRAMS

1. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
2. Write a Java program to do all arithmetic operations.
3. Write a Java program that checks whether a given string is a palindrome or not.
4. Write a Java program to multiply two given matrices.
5. Write a Java program to create a Student class with the fields –

   i. Register number ii. Student Name iii. Department. Create ‘n’ number of Student objects where ‘n’ value is passed as input to constructor.
6. Write a Java program that creates three threads. First thread displays “Good Morning

Everyone" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.

7. Write a Java program that construct house using graphical components.
8. Develop simple calculator using Swings.
9. Write a Java program that reads a file and displays the file on the screen, and also displays the number of characters, lines and words in a text file.
10. Write a Java program that make the server receive a message from the client and sends it back.
11. Write a Java program that checks whether a given website is reachable using Java's Inet Address.
12. Write a Java program that fetches the public IP address of the machine.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student(3Hours/60Marks)

1. Record Work-10 Marks

Algorithm, Program, Typing and Execution : 50 Marks

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

UCA 20

Sub.Code:25UCA2CM

MAPPING

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

S - Strong **H** – High **M**–Medium **L** –Low

UCA 21

Sub Code: 25UCA303

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Paper 3 – Relational Database Management System**			
Batch 2025 - 2028	**Hours Week 4**	**Total Hours 60**	**Credits 3**	**Skill Development**

Course Objectives

1. Understand Database Concepts – Explain DBMS, RDBMS, and Codd's Rules.
2. Design Efficient Databases – Create ER diagrams and apply normalization.
3. Use SQL Effectively – Execute DML, DDL, and DCL commands with constraints.
4. Implement PL/SQL – Develop triggers, procedures, functions, and exception handling.
5. Explore Advanced Applications – Understand data mining, warehousing, and web databases.

Course Outcomes (CO)

K1 to K5	CO1	Understanding the concepts of Database.
	CO2	Understanding the concept of Data Integrity constraints.
	CO3	Applying various DDL and DML statements, joins queries, PL / SQL statements.
	CO4	Applying various types of database management systems for developing the program.
	CO5	Evaluate the usage of normalization in relational database management system.

Syllabus

UNIT I **(Hours 12)**

Introduction: Purpose of Database Systems-DBMS and RDBMS-Entity Relationship Diagram, Weak and Strong Entity sets – Codd's Rules. Normalization-Oracle Terminology – Data types - Basics of SQL :-DML-select command , insert , update, delete set operations, usage of Where Clause, DDL *,DCL-Operators Aggregate functions. UCA 19

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Sub Code: 25UCA303

UNIT II **(Hours 12)**

Data Constraints: -NULL value Concepts-Default value Concepts-Primary Key concepts-Unique Key Concepts-Foreign Key Concepts-Check Key Integrity Constraints-Renaming Columns with Expression List-Range Searching-P attern Searching Manipulating Strings and Dates.

UNIT III **(Hours 12)**

Sophisticated queries-Built in group functions- Joined Relations-Nested Sub queries – Views – Sequences and Synonyms-Table Indexes- Table Partition and Joining of two tables.

UNIT IV **(Hours 12)**

Database Triggers: – Use of Database Triggers-How to apply Database Triggers-Types of Triggers-Combinations-Keywords and Parameters-Dropping Triggers-Basics of PL/SQL –Usage of Stored Functions and Procedures- -How do procedures reside-Parameters. Packages-Retrieving data with Cursors-Formatting table. Exception handling.

UNIT V **(Hours 12)**

New Applications: Decision Support Systems - Data Analysis - Data Mining - Data Warehousing - Spatial and Geographic Databases - Multimedia Databases - Mobility and Personal Databases - Information - Retrieval Systems - Distributed Information Systems - The World Wide Web *. Working with Reports-Default tabular report- PL/SQL with reports.

*** Self Study Topic and Questions for examinations may be taken from Self Study Portions also.**

Teaching Methods

Projectors, Seminar, Discussions

Text Books:

1. Abraham Silberschatz , Henry F. Korth, S. Sudharshan,(2002),"Database System Concepts", Fourth Edition -Tata McGraw Hill International Editions.
2. Ivan Bayross ,(2000), "Commercial Application Development using Oracle developer 2000", BPB publications.

Sub Code: 25UCA303

Reference Books

1. Pratt, P. J., Adamski, J. J., (2021), "Concepts of Database Management", Tenth Edition – Cengage – publication
2. David Loctman, (1997), "Developing Personal Oracle For Windows 95", Sams Publishing, 2nd Revised Edition.
3. Elmasri Navathe,(2001), "Fundamentals of Database Systems", First Edition-Pearson Education publication.
4. Sharad Maheshwari & Ruchin Jain,(2006),"Database Management Systems" Complete Practical Approach", Second Edition
5. Nilesh Shah,(2007), "Database Systems using Oracle" A Simplified Guide to SQL & PL/SQL, Second Edition ,Prentice Hall of India Private Ltd, New Delhi.
6. Ivan Bayross,(1995),"Oracle 7 The Complete Reference", BPB Publications.

MAPPING

PSO / CO	PSO1	PSO 2	PS 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	H	S	M	H	S
CO4	S	M	S	M	H
CO5	S	H	S	S	H

S – Strong **H** – High **M** – Medium **L** – Low

UCA 24

Sub.Code: 25UCA3CN

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Practical 3 – Relational Database Management System Lab**			
Batch 2025-2028	**Hours Week 4**	**Total Hours 60**	**Credits 4**	**Skill Development**

Course Objectives

1. Perform SQL Operations – Create, query, and manipulate tables using SQL.
2. Manage Databases – Implement views, sequences, and table modifications.
3. Develop PL/SQL Programs – Use procedures, functions, cursors, and triggers.
4. Apply Advanced PL/SQL – Work with exceptions, packages, and automation.
5. Build Real-world Applications – Design PL/SQL solutions for practical use cases.

Course Outcomes (CO)

K3 to K5	CO1	Designing the basic concepts of Database.
	CO2	Implementing data Integrity constraints in Database.
	CO3	Validating the various fundamental tasks to perform data modeling.
	CO4	Implementing functions, packages, stored procedures and user defined exception.
	CO5	Evaluate the trigger function to perform event.

LIST OF PRACTICAL PROGRAMS

1. Creating Tables and writing simple queries using
   a) Comparison Operators
   b) Logical Operators
   c) Set Operators
   d) Sorting and Grouping
2. Creation of Reports using Column format
3. Writing Queries using built in functions.

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Sub.Code: 25UCA3CN

4. Updating and altering tables using SQL.
5. Creation of Students Information table and write PL/SQL Block find the Total, Average marks and Results.
6. Design a PL/SQL block to prepare the Electricity Bill.
7. Programming with Cursors: Code a PL/SQL Block to partition the students Information Table into two, one with the Passed and other with Failed.
8. Implement the concepts of Joined relations to Database.
9. Create a Database Trigger to check the data validity of Record.
10. Recursive Functions Write a Recursive function to find
    a) Factorial of N
    b) Fibonacci Series with N terms.
11. Use SQL queries to manage Views, Sequences and Synonyms
12. Create a Database Trigger to implement the Master - Detail Relationship.

Teaching Methods

Smart Classroom, Projectors, Discussion

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program, Typing and Execution: 50 Marks
3.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

UCA 26

Sub.Code: 25UCA3CN

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	H	H
CO2	S	S	H	S	S
CO3	S	M	H	H	H
CO4	S	S	M	S	M
CO5	H	S	S	S	H

S – Strong **H** – High **M** – Medium **L** – Low

UCA 27

Sub. Code :25UCA404

Programme Code:10		**Bachelor of Computer Applications**		
Title of the Paper		**Core Paper 4 – Python Programming**		
Batch 2025-2028	**Hours Week 4**	**Total Hours 60**	**Credits 3**	**Skill Development**

Course Objectives

1. To acquire programming skills in core Python and to learn and understand Python programming
   Basics and paradigm
2. To Learn core Python scripting elements such as variables and flow control structures
3. To learn and understand python looping, control statements and string manipulations.
4. To learn how to use exception handling in Python applications for error handling.
5. To use Python data structures, lists, tuples, dictionaries.

Course Outcomes (CO)

K1 to K5	CO1	Develop algorithmic solutions to simple computational problems and Read, write, execute by hand simple Python programs.
	CO2	Structure simple Python programs for solving problems
	CO3	Decompose a Python program into functions and Discover how to work with lists and sequence data.
	CO4	Represent compound data using Python lists, tuples, dictionaries.
	CO5	Analyze the granting and revoking permissions in cursors and Normalization forms.

Syllabus

UNIT I **(12 Hours)**

Computer Hardware Architecture - Overview of Programming Languages - Overview of Programming Languages - Introduction to Python - Python Overview – Comments in Python - Python Identifiers - Reserved Keywords – Variables - Standard Data Types - Python Casting.

UCA 28

Sub. Code : 25UCA404

UNIT II **(12 Hours)**

Python Operators – Types of Operators - Statement and Expressions - String Operations: Creating String in Python - Strings indexing and splitting - Reassigning Strings- Deleting the String - String Operators - Multiline Strings- Built-in String Methods-Boolean Expressions – Python List – Various List Operation – Loop List - List Methods.

UNIT III **(12 Hours)**

Python Tuples – Various Tuples Operations – Loop Tuples -Tuple Methods – Python Set – Various Set Operations – Loop Set – Set Methods – Python Dictionaries – Various Dictionaries Operations – Nested Dictionaries – Dictionary Methods - Python Dates- Python Conditions and Python IF Statement- Python IF ELIF ELSE Statements - Python nested IF statements- The pass Statement.

UNIT IV **(12 Hours)**

Python Loops - Python while Loop Statements-Infinite Loop- for Loop Statements- Iterating by Sequence Index - Python nested loops- Python Numbers- Mathematical Functions- Random Number Functions- Python Functions - Calling a Function - Pass by reference vs value - Function Arguments - The return Statement -Python Lambda functions.

UNIT V **(12 Hours)**

Scope of Variables - Local Scope- Global Scope- Python Exceptions Handling - Assertions in Python - Handling an exception - Python String Formatting - Python User Input- Python Files I/O - File Handling- File Open- Read Only Parts of the File- Read Lines- Close Files- Python File Write Create a New File -Delete File- Delete Folder- Python Matplotlib.

*****Self Study and questions for examinations may be taken from the self study portions also.

UCA 29

Sub. Code : 25UCA404

Teaching Methods

Smart Class Room / Power point presentation / Seminar / Quiz / Discussion / Flipped Class

Text Book

1. Allen B. Downey, (2016) "Think Python: How to Think Like a Computer Scientist'', 2ndedition, Updated for Python 3, Shroff/O'Reilly Publishers, (http://greenteapress.com/wp/think/python/) .
2. Guido van Rossum and Fred L. Drake Jr,(2011) "An Introduction to Python – Revised and updated for Python 3.2", Network Theory Ltd

Reference Books

1.Eric Matthes, (2023) *"Python Crash Course"*, 3rd edition, Updated for Python 3.11, No Starch Press, (https://nostarch.com/python-crash-course-3rd-edition)

2.John V Guttag, (2013) "Introduction to Computation and Programming Using Python'', Revised and expanded Edition, MIT Press.

3.Robert Sedgewick, Kevin Wayne, Robert Dondero, (2016) "Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd.

4.Timothy A. Budd, (2015) "Exploring Python", Mc-Graw Hill Education (India)Private Ltd.

5.Kenneth A. Lambert, (2012) "Fundamentals of Python: First Programs", CENGAGE Learning.

6.Charles Dierbach, (2013) "Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition.

7.Paul Gries, Jennifer Campbell and Jason Montojo, (2013) "Practical Programming: An Introduction to Computer Science using Python 3", Second edition, Pragmatic Programmers, LLC.

UCA 30

Sub. Code : 25UCA404

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	M	M	H
CO2	S	M	S	S	S
CO3	S	S	H	M	M
CO4	S	M	H	H	M
CO5	S	S	S	H	H

S –Strong **H** –High **M**– Medium **L** –Low

UCA 31

Sub. Code: 25UCA4CO

Programme Code:10		**Bachelor of Computer Applications**		
Title of the Paper	**Core Practical 4 – Data Structure using Python Lab**			
Batch 2025-2028	**Hours Week 4**	**Total Hours 60**	**Credits 4**	**Skill Development**

Course Objectives

1. Implement sorting algorithms like Bubble Sort, Selection Sort, and Quick Sort in Python.
2. Apply and optimize searching techniques, including Linear and Binary Search.
3. Perform operations on data structures like Stacks, Queues, and Binary Search Trees.
4. Develop recursive algorithms and tree traversal methods for complex problems.
5. Work with advanced data structures like Doubly Linked Lists for insertion, deletion, and traversal.

Course Outcomes (CO)

K3 to K5	CO1	Understanding of common sorting algorithms such as Bubble Sort, Selection Sort, and Quick Sort, and apply them to sort lists in ascending order.
	CO2	Implementing and Understanding Searching Techniques
	CO3	Applying Data Structures for Problem Solving.
	CO4	Understanding and Applying Recursion Techniques.
	CO5	Working with Linked Lists and Complex Data Structures.

LIST OF PRACTICAL PROGRAMS

1. Write a python program to arrange the elements in ascending order using bubble sort.
2. Write a program to implement Linear Search .
3. Write a program to implement Stacks and its operations.

4.Write a program to implement Merge sort .

Sub. Code: 25UCA4CO

5.Write a program to implement Queues and its operations.

6.Write a program to implement Binary Search Tree.

7.Write a Python program to traverse the tree using pre-order, post-ordered and in order traversals.

8.Write a program to find a given data in the existing list using both linear and binary search

9.Write a Python program to implement tower of hanoi.

10.Write a Python program to sort a list of elements using the selection sort.

11.Write a Python program to sort a list of elements using the quick sort algorithm.

12.Write a python program to implement Doubly linked list to perform insertion and deletion .

Teaching Methods

Smart Classroom, Projectors, Discussion, Flipped Class, Assignment, Video Lectures

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program , Typing and Execution : 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

UCA 33

Sub. Code: 25UCA4CO

MAPPING

PSO / CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	H	M	H	H	H

S –Strong **H** –High **M**– Medium **L** –Low

UCA 34

Sub.Code: 25UCA4A4

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper: Allied Paper 4 – Data Structures				
Batch 2025-2028	**Hours Week 6**	**Total Hours 90**	**Credits 5**	**Skill Development**

Course Objectives

1. To introduce the fundamental concept of data structures.
2. To emphasize the importance of data structures in developing and implementing efficient algorithms.
3. Understand the need for Data Structures when building application.
4. Ability to calculate and measure efficiency of code.
5. Improve programming logic skills.

Course Outcome

K1 TO K5	CO1	Understand the basic concepts of data structures and algorithms.
	CO2	Construct and analyze of stack and queue operations with illustrations.
	CO3	Enhance the knowledge of Linked List and dynamic storage management.
	CO4	Demonstrate the concept of trees and its applications.
	CO5	Design and implement various sorting and searching algorithms for applications and understand the concept of file organizations.

Syllabus

UNIT I **(18 Hours)**

Introduction of Algorithms, Analyzing Algorithms. Arrays: Sparse Matrices– Representation of Arrays. Stacks and Queues. Fundamentals–Evaluation of Expression Infix to Postfix Conversion –Multiple Stacks and Queues.

UNIT II **(18 Hours)**

Linked List: Singly Linked List – Linked Stacks and Queues – Polynomial Addition- More on

Linked Lists – Sparse Matrices – Doubly Linked List and Dynamic – Storage Management – Garbage Collection and Compaction.

UNIT III **(18 Hours)**

Basic Terminology – Binary Trees – Binary Tree Representations – Binary Trees-Traversal-More on Binary Trees – Threaded Binary Trees – Binary Tree. Representation of Trees – Counting Binary Trees. Graphs: Terminology and Representations-Traversals, Connected Components and Spanning Trees, Shortest Paths and Transitive Closure.

UNIT IV **(18 Hours)**

Storage Devices–Sorting with Disks: K-Way Merging–Sorting with Tapes Symbol Tables: Static Tree Tables–Dynamic Tree Tables–Hash Tables: Hashing Functions–Overflow Handling.

UNIT V **(18 Hours)**

Files - queries and sequential organizations * - index techniques. File organizations sequential, random, linked organizations - inverted files - cellular partitions.

*** denotes Self study**

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Book:

1. Ellis Horowitz & Sartaj Sahani , (2008)- "Fundamentals of data structure", First Edition Galgothia book source.

Reference Books:

1. Ashok N Kamthane,(2004),“Programming and Data Structures”, First Edition,PearsonEducation.
2. AlfredV.Aho, JohnE. Hopcroft,Jeffrey D.Ullman,(2008) – “Data Strctures and algorithms”, Pearson Education,.

UCA 36

Sub.Code: 25UCA4A4

MAPPING

PSO / CO	PSO1	PSO1	PSO1	PSO1	PSO1
CO1	**S**	**S**	**M**	**S**	**S**
CO2	**S**	**H**	**H**	**H**	**S**
CO3	**H**	**H**	**S**	**M**	**H**
CO4	**S**	**H**	**M**	**S**	**L**
CO5	**H**	**S**	**S**	**H**	**M**

S – Strong **H** –High **M**–Medium **L**–Low

UCA 37

Sub.Code: 25UCA505

Programme Code:10		**Bachelor of Computer Applications**		
Title of the Paper		**Core Paper 5 – Software Engineering**		
Batch 2025 - 2028	**Hours Week 6**	**Total Hours 90**	**Credits 4**	**Skill Development**

Course Objectives

1. To understand Software Engineering fundamentals.
2. To explore software development life cycle (SDLC) models.
3. To Apply Software Design and Development Techniques.
4. To describe software engineering layered technology and Process frame work.
5. To gain knowledge about quality control and how to ensure good quality software.

Course Outcomes (CO)

K1 to K5	CO1	Learning the fundamentals of software engineering concepts.
	CO2	Understanding common lifecycle processes such as waterfall model, spiral model, prototyping model, evolutionary models etc.,
	CO3	Applying the principles and techniques of software engineering in the architectural design, detail design, and implementation of software applications.
	CO4	Developing the software using different testing concepts.
	CO5	Evaluating the ability of students to perform various lifecycle activities like Analysis, SDesign, Implementation, Testing and Maintenance.

Syllabus

UNIT I **(18 Hours)**

Introduction to Software Engineering: Introduction: Professional Software Development: Software Engineering-Software Engineering diversity-Internet Software Engineering-Software Engineering Ethics: Case Studies-*An insulin pump control system -Software Processes: Software

Sub.Code: 25UCA505

Process Models- Waterfall Model-Incremental Development-Integration and Configuration.

UNIT II **(18 Hours)**

Process Activities: Software Specification-Software design and Implementation-Software Validation- Software Evolution-Requirements Engineering: Functional and Non-Functional Requirements- Requirements Engineering Process-Requirements Elicitation-Requirements elicitation Techniques- Stories and Scenarios-Requirements Specification: Natural Language Specification-Structured Specification-Use cases-The Software Requirements document.

UNIT III **(18 Hours)**

Architectural Design: Architectural design decisions: Architectural views-Architectural patterns: Layered Architecture-Repository Architecture-Client-Server Architecture-Pipe and Filter Architecture. Software Testing: Development Testing: Unit Testing-Choosing unit test cases-Component testing- System testing- Test-Driven Development: Release Testing: Requirement based testing-Scenario testing-Performance testing-User Testing.

UNIT IV **(19 Hours)**

Software Management: Project Management-Risk Management -Risk Identification-Risk Analysis-Risk Planning-Risk monitoring-Managing People: *Motivating People-Team work: Selecting group members-Group organization-Group Communications. Project Planning: Software Pricing-Plan-driven Development-Project Plans-The Planning Process-Project Scheduling: Schedule Presentation- Estimation Techniques: Algorithmic Cost Modelling-COCOMO Cost Modelling: The Application Composition Model-The early design Model-The reuse Model-Post Architectural level-Project Duration and Staffing.

UNIT V **(17 Hours)**

Quality Management: Software Quality-Software Standards-The ISO 9001 standards framework- Reviews and Inspections: The review process-program Inspections. Quality Management and Agile Development: Software Measurement: Product Metrics-Software Component Analysis-Measurement Ambiguity-Software Analytics.

UCA 39

Sub.Code: 25UCA505

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Book

1. Ian Sommerville, Software Engineering 10e", Pearson India Education Services Pvt Ltd-10th Edition 2018

Reference Books

1. "Software Engineering" by Udit Agarwal – 1st Edition (2023), Publisher: Wiley India,A newer Indian author offering concise content for BTech and MTech-level students.

2. Sommerville, (2006), "Software Engineering", Pearson India Education Services Pvt Ltd-10th Edition (reprint)

3. Software Engineering, (2007)," Principles and Practices- Vikas Publishing House Pvt Ltd , ITL Education Solutions Ltd.

4. Software Engineering, (2008)," Principles and Practices-Waman S.Jawadekar-Tata McGrawhill Publishing Company limited, (7th reprint)

5. Rajib Mall,(2007)," Fundamentals of Software Engineering"- Prentice Hall of India private Ltd
    i. -Second Edition 20th Printing.

UCA 40

Sub.Code: 25UCA505

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	S	H	S	M	H
CO2	S	M	H	S	M
CO3	S	H	M	H	S
CO4	S	S	H	M	H
CO5	S	S	S	H	H

S-strong **H**- high **M** – medium **L**-low

UCA 41

Sub. Code: 25UCA506

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	**Core Paper 6 – Operating Systems**			
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. Understand OS fundamentals: hardware, memory, and process management.
2. Explore process models, IPC, and thread management.
3. Analyse scheduling, memory management, and virtual memory.
4. Examine file systems, directories, and implementation.
5. Study deadlocks, I/O management, and Linux-Windows I/O case study.

Course Outcome

K1 TO K5	CO1	Explain operating system concepts, architecture, and different types of OS structures.
	CO2	Describe process models, inter-process communication, and thread management.
	CO3	Analyze CPU scheduling algorithms, memory management techniques, and page replacement strategies.
	CO4	Evaluate file system structures, disk space management, and backup techniques.
	CO5	Understand deadlocks, I/O software and hardware principles, and compare I/O management in Linux and Windows.

Syllabus

UNIT I **(15 Hours)**

Introduction - history of operating system-processors - computer hardware - memory - disk - input and output devices - buses - different kinds of operating system – Operating system concepts – System calls- Operating system structure - monolithic - layered - microkernel - client/server models – virtual machines.

UNIT II **(15 Hours)**

Processes -process model -process creation - process termination -process hierarchies - process states- threads - thread model and usage- classical thread model- inter process communication – race conditions - critical regions - semaphores– mutexes.

Sub. Code: 25UCA506

UNIT III **(15 Hours)**

Introduction to scheduling - scheduling in batch systems - interactive systems -real time systems – Thread Scheduling - Memory Abstraction -notion of an address space -swapping - managing free space – Virtual Memory - Page replacement algorithms - design issues for paging systems – Segmentation.

UNIT IV **(15 Hours)**

Files-File Naming-File Structure-File Types-File Access-File Attributes-File Operations-Directories : Single Level – Hierarchical Level-Path Names – File System Implementation – File System Layout – Implementation Files – Implementation Directories.

UNIT V **(15 Hours)**

Introduction to Deadlocks - conditions for deadlocks-deadlock modeling-deadlock detection and recovery-deadlocks avoidance - deadlock prevention. Input / Output : Principles of Hardware: I/O Devices – Memory Mapped I/O – Direct Memory Access - Case Study: I/O Management in Linux and Windows.

*** denotes Self study**

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Book:

1. Andrew S. Tanenbaum, 2015, "Modern Operating Systems", 4th Edition, PHI New Delhi.

Reference Books:

1. Silberschatz, A., Galvin, P. B., & Gagne, G., 2022, *Operating System Concepts*, 10th Edition, Wiley, Hoboken.

2. William Stallings, 2018, "Operating Systems - Internals & Design Principles", (9th Edition, PHI private Ltd, New Delhi.

3. Sridhar Vaidyanathan, 2014, "Operating System", 1st Edition, Vijay Nicole Publications.

4. Abraham Silberschatz, Greg Gagne, Peter B. Galvin, 2018, "Operating Systems Concepts", 10th Edition, John Wiley.

UCA 43

Sub. Code: 25UCA506

MAPPING

PSO / CO	PSO1	PSO1	PSO1	PSO1	PSO1
CO1	**S**	**S**	**M**	**S**	**S**
CO2	**S**	**H**	**H**	**H**	**S**
CO3	**H**	**H**	**S**	**M**	**H**
CO4	**S**	**H**	**M**	**S**	**L**
CO5	**H**	**S**	**S**	**H**	**M**

S – Strong **H** – High **M** – Medium **L** – Low

UCA 44

Sub.Code: 25UCA507

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Paper 7 - Artificial Intelligence and Machine Learning**			
Batch 2025 - 2028	**Hours Week 6**	**Total Hours 90**	**Credits 4**	**Skill Development**

Course Objectives

1. To learn the concepts of Artificial Intelligence.
2. Create awareness of informed search, exploration methods, Planning, and knowledge discovery.
3. To demonstrate ML techniques for problem-solving using benchmark datasets.
4. To determine the Neural network concepts to predict the datasets related problems.
5. Explore Deep learning techniques for solving optimization problems.

Course Outcomes (CO)

K1 to K5	CO1	Analyze and evaluate informed search and exploration methods.
	CO2	Apply AI techniques for knowledge representation, planning, and decision-making.
	CO3	Analyze and develop knowledge of Communication and learning methods for real-time application
	CO4	Demonstrate Machine Learning algorithms with example Problems
	CO5	Explore how ML is already being used and evaluate problem areas of AI

Syllabus

UNIT I **(18 Hours)**

Problem Solving**:** Search algorithm – Uniformed Search Strategies - Informed Search Strategies – Heuristic Functions - Propositional logic: A very-simple logic. First order logic: Representation revisited – Syntax and semantics for first-order logic –Using first order logic. Inference in First order logic: propositional versus first order logic –forward chaining – backward chaining.

Sub.Code: 25UCA507

UNIT II **(18 Hours)**

Automated Planning: Algorithm for classical Planning – Heuristic for planning – Hierarchical Planning. Quantifying Uncertainty: Bayes's Rule and Its use – Naïve Bayes Models. Making Simple Decisions: The basis of Utility theory – Multi-attribute utility functions –Decision networks – The value of information**.**

UNIT III **(18 Hours)**

Knowledge Based Learning: A Logical Formulation of Learning – Knowledge in Learning – Explanation Based Learning – Learning using Relevance Information. Reinforcement Learning: Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning. Communication: Grammer – Parsing – Augmented grammar.

UNIT IV **(18 Hours)**

Introduction to ML: Machine Learning – Aspects of ML – ML Applications and Examples. Supervised and unsupervised Learning – Clustering: k-means Clustering – Fuzzy Clustering. Artificial Neural Network: ANN Basics – The Perceptron – RBF Network. Association Rule Mining: Apriori Algorithm- Case Study : Decision Making with IKS.

UNIT V **(18 Hours)**

Deep Learning: Convolutional Neural Network – TensorFlow. Support Vector Machine – Ensemble Classifier: Types of Ensembles – Algorithm based on Bagging and Boosting – Decision Tree: Decision Tree Algorithm – Decision Tree and Random Forests.

* **Self-study and questions for examinations may be taken from the self- study portions also**

Teaching Methods

Smart Classroom/PowerPoint presentation/Seminar/Quiz/Discussion

Text Books

1. Stuart Russell, Peter Norvig, (2023) "Artificial Intelligence – A Modern Approach", Fourth Edition, Pearson Education / Prentice Hall of India.

2. Vinod Chandra S. S, Anand Hareendran S, "Machine Learning: A Practitioner's Approach", PHI Learning, 2024

Reference Books

1. Elaine Rich, Kevin Knight, Shivashankar.B.Nair, (2009), "Artificial Intelligence", Tata Mc Graw Hill Publishing Company Limited. Third Edition.
2. Nils J. Nilsson, (2000), "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd...
3. George F. Luger, (2002), "Artificial Intelligence-Structures and Strategies for Complex ProblemSolving", Pearson Education / PHI.

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong **H** – High **M** – Medium **L** – Low

UCA 47

Sub Code: 25UCA5CP

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Practical 5 - Artificial Intelligence and Machine Learning Lab**			
Batch 2025-2028	**Hours Week 6**	**Total Hours 90**	**Credits 3**	**Skill Development**

Course Objectives

1. Be able to create loops and decision statements in Python.
2. Be able to work with functions and pass arguments in Python.
3. To familiarize the students with working in advanced concepts in Python.
4. To implement AI problems in python.
5. Apply the Benchmark dataset to the machine learning algorithm in Python.

Course Outcomes (CO)

K3 to K5	CO1	Understand the basic concepts of Python.
	CO2	Understand the fundamentals of knowledge representation, Search Algorithms and inference.
	CO3	Understand the fundamentals of theorem proving using AI tools.
	CO4	Demonstrate working knowledge of reasoning in incomplete and/or uncertain information.
	CO5	Apply ML techniques and technologies to solve real-world problems.

LIST OF PRACTICAL PROGRAMS

1. Program to implement Informed Search Technique: A* Algorithm.
2. Program to Implement 8-Puzzle problem using Python.
3. Program to Implement Alpha-Beta Pruning using Python.
4. Program to Implement Monkey Banana Problem using Python
5. Program to Implement Tower of Hanoi using Python.
6. Program to Implement Alpha-Beta Pruning using Python.
7. Program to Implement the Water-Jug problem using Python.
8. Write a program to implement the k-Nearest Neighbour algorithm to classify the iris data set.

Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.

9. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets.

10. Program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering a few test data sets.

11. Apply the EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using the k-Means algorithm. Compare the results of these two algorithms and comment on the clustering quality. You can add Java/Python ML library classes/API to the program.

12. Implement the non-parametric Locally Weighted Regression algorithm to fit data points. Select appropriate data set for your experiment and draw graphs.

Guide lines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work – 10 Marks
2. Algorithm, Program, Typing, and Execution: 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

PSO / CO	**PSO1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	S	H	S	H	S
CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	H	M	H	H	H
CO5	**H**	**S**	**S**	**H**	**M**

S– Strong **H** –High **M**–Medium **L** –Low

UCA 49

Sub. Code: 25UCA608

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Paper 8 - Data Science with R programming**			
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. To learn about basics of Data Science and R.
2. To learn about overview and building process of Data Science.
3. To learn about the importance of Machine Learning.
4. This course is to equip the students to handle large data sets using R and to communicate statistical results in correct manner
5. To expose the student to learn coding standards of R Programming.

Course Outcomes

K1toK5	CO1	Understand the basics in Data Science and Big data
	CO2	Understand overview and building process in Data Science.
	CO3	Understand the need, types and applications of Machine Learning.
	CO4	Understand how to handle large data sets in Data Science.
	CO5	Case study in Data Analysis and various R operations.

Syllabus

UNIT I **(14Hours)**

Defining Data Science and Big Data, Benefits and Uses, Faculties of Data, Data Science Process. History and Overview of R, Getting Started with R, R Nuts and Bolts: Entering Input – Creating Vectors – Lists, Factors, Data Frames**.**

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Sub Code: 25UCA608

UNIT II **(15 Hours)**

The Data Science Process: Overview of the Data Science Process- Setting the research goal, Retrieving Data, Data Preparation, Exploration, Modeling, Data Presentation, and Automation. Getting Data in and out of R, Using reader package.

UNIT III **(15 Hours)**

Machine Learning: Understanding why data scientists use machine learning- What Machine learning and why we should care about, Applications of machine learning in data science, where it is used in data science, The modeling process, Types of Machine Learning-Supervised and Unsupervised.

UNIT IV **(15 Hours)**

Handling large Data on a Single Computer: The problems we face when handling large data, General Techniques for handling large volumes of data, Generating programming tips for dealing with large datasets, Sub setting R objects.

UNIT V **(16 Hours)**

Vectorized Operations, Managing Data Frames with the dplyr, Control structures, functions, Coding Standards in R, Loop Functions, Debugging, Simulation. Case studies on preliminary data analysis.

Teaching Methods

Smart Class Room/Power point presentation/Seminar/Quiz/Discussion

Text Books

1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, "Introducing Data Science", manning publications 2016.

2. Roger D. Peng, "R Programming for DataScience" Lean Publishing, 2015.

UCA 51

Sub Code: 25UCA608

Reference Books

1.Biecek, P., & Burzykowski, T., 2021, Explanatory Model Analysis, Chapman and Hall/CRC, Boca Raton.

2. Nina Zumel, John Mount, "Practical Data Science with R", Manning Publications, 2014.

3. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, "Practical Data Science Cookbook", Packt Publishing Ltd., 2014.WebReferences for case studies:

1. https://www.kaggle.com/datasets

2. https://github.com/

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong **H** – High **M** – Medium **L** – Low

UCA 52

Sub Code: 25UCA6CQ

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Practical 6 – Data Science with R Programming Lab**			
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. Understand and Apply R Basics – Create and manipulate vectors, lists, and data structures.
2. Perform Data Operations – Utilize built-in functions like sum(), min(), max(), and seq() for computations.
3. Implement Text and Data Processing – Use functions like grep(), toupper(), tolower(), and substr() for text manipulation.
4. Develop Loops and Control Structures – Implement loops and loop functions (apply(), lapply(), sapply(), etc.) for efficient data handling.
5. Analyze and Visualize Data – Explore datasets using ggplot2, histograms, scatter plots, bar charts, and dplyr for data manipulation.

Course Outcomes (CO)

K3 to K5	CO1	Understand the basics in R programming in terms of constructs, control statements, string functions
	CO2	Understand the processes of WE identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization.
	CO3	Understand the basics of statistical computing and data analysis.
	CO4	Extract data from files and other sources and perform various data manipulation ton them.
	CO5	Apply the R programming from a statistical perspective

LIST OF PRACTICAL PROGRAMS

1. Create a vector in R and perform operations on it.
2. Write code in R to demonstrate sum(), min(), max() and seq() functions.
3. Write code in R to manipulate text in R using grep(), toupper(), tolower() and substr() functions.
4. Write a program to find list of even numbers from 1 to n using R-Loops.
5. Implement different data structures and perform operations on it (Matrices, Data frames).

6. Demonstrate the visualization and graphics using visualization packages like ggplot2.
7. Implement Loop functions with lapply(), sapply(), tapply(), apply(), mapply().
8. Explore data using Single Variables: Unimodal, Bimodal, Histograms, Density Plots, Bar charts.
9. Explore data using two Variables: Line plots, Scatter Plots, Bar charts
10. Explore and implement commands using dplyr package.
11. Write a program to read a csv file and analyze the data in the file in R.
12. Create a data set and do statistical analysis on the data using R.

Teaching Methods

Smart Classroom, Projectors, Discussion

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

4. Record Work - 10 Marks
5. Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

MAPPING

PSO / CO	**PSO1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	H	S	M	M	M
CO2	S	H	S	M	M
CO3	M	S	H	M	M
CO4	M	M	M	H	S
CO5	M	M	M	S	H

S – Strong **H** – High **M** – Medium **L** – Low

UCA 54

Sub.Code: 25UCA6CR

Programme Code:10		**Bachelor of Computer Applications**		
Title of the Paper:		**Core Practical 7- Web Designing Lab**		
Batch 2025-2028	**Hours Week 4**	**Total Hours 60**	**Credits 3**	**Skill Development**

Course Objectives

1. To implement the concepts in visual design and content structuring.
2. To understand the concept of Bootstrap to develop their web development skill.
3. To demonstrate the role of languages like HTML, CSS, JavaScript, and protocols in the workings of the web and web applications.
4. To design and develop websites using fundamental web languages, technologies, and tools.
5. To facilitate students to create a website using HTML and Bootstrap.

Course Outcomes (CO)

K3 to K5	CO1	Applying the HTML tags to design Web Pages.
	CO2	Designing attractive web sites using Cascading Style Sheet.
	CO3	Developing user friendly interactive web application using JavaScript.
	CO4	Implementing different operations on JavaScript Functions and Events.
	CO5	Evaluating the functionality of web pages using HTML, CSS, JavaScript and Bootstrap.

LIST OF PRACTICAL PROBLEMS

1. Design a web page for your Department.
2. Design a new web page, which shows your Biodata using CSS.
3. Design a web page for a company using HTML Formatting Tags.
4. Use table tag to format web page and also create the Time Table of your class using table
5. Create your profile page i.e. educational details, Hobbies, Achievement, My Ideals etc.
6. Design a web page for Computing Student Mark list using JavaScript.

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Sub.Code: 25UCA6CR

7. Design a web page for an Advertising using Style Sheets.
8. Design a web page with the following components using JavaScript.
   a) Image b) Hyperlink c) Scroll Bar d) Animation.
9. Design a web page for Library system using HTML Tags.
10. Design a web page for Payroll Processing using Java Script.
11. Design a web page for Electricity Bill Preparation using JavaScript.
12. Creating a Table using Bootstrap.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 60 Marks)

1. Record Work - 10 Marks
2. Algorithm, Program, Typing and Execution: 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	10	10
Typing and Execution	10	10

Teaching Methods

Smart Classroom, Projectors, Discussion

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	S	M	H	M	H
CO5	S	S	S	S	S

S – Strong **H** – High **M** – Medium **L** – Low

UCA 56

Sub.Code: 25UCA609

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper: Core Paper 9 - Computer Networks				
Batch 2025-2028	**Hours Week 5**	**Total Hours 75**	**Credits 4**	**Skill Development**

Course Objectives

1. Understand computer networks, hardware, software, and standardization.
2. Explore wireless transmission technologies and their applications.
3. Analyze data link layer design, error handling, and MAC protocols.
4. Examine network layer functions, routing, and congestion control.
5. Study transport and application layer protocols, security, and network applications.

Course Outcomes (CO)

K1 to K5	CO1	Explain the fundamental concepts of computer networks, network hardware, software, and standardization models.
	CO2	Describe wireless communication technologies, including mobile networks, telephone systems, and satellite communication.
	CO3	Analyze data link layer design issues, error detection and correction techniques, and multiple access protocols.
	CO4	Compare different network layer protocols, routing algorithms, and congestion control methods.
	CO5	Evaluate transport layer services, security mechanisms, and application layer protocols such as HTTP, DNS, and email.

Syllabus

UNIT I **(14 Hours)**

Introduction: Uses of Computer networks – Network Hardware - Network Software - Reference Models: The OSI Reference Models- The TCP/IP Reference Model-Example Networks: The Internet- Third – Generation Mobile Phone Networks- Wireless Lans:802.11- Network Standardization- Metric Units.

UCA 57

Sub.Code: 25UCA609

UNIT II **(15 Hours)**

Introduction to Wireless Transmission - Functions - Advantages of wireless communication - Communication Satellites – Telephone System: Structure - Local Loop - Trunks and Multiplexing and Switching-Cable Television.

UNIT III **(15 Hours)**

Data Link Layers Design Issues: Services Provided to the Network Layer – Framing– Error Detection and Correction: Error Correcting Codes- Error Detecting Codes- Elementary Data Link Protocols-Sliding Window Protocols-Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – An overview of IEEE Standard for LANs - MAC Address - Bluetooth.

UNIT IV **(15 Hours)**

Network layer: Network layer Design Issues: Store-and-forward Packet Switching – Services Provided to the Transport Layer-Implementation of Connectionless Service- Comparison of Virtual -Circuit and Datagram Networks- Routing Algorithms-Congestion control algorithms - Network Protocols - IP- IPV4 - IPV6 - Subnets - Gateways- Congestion Avoidance in Network Layer.

UNIT V **(16 Hours)**

Transport Layer - Services - Connection Management - Addressing - Establishing and Releasi a Connection – Simple Transport Protocol – Internet Transport Protocols (ITP) - Network Secur - Cryptography - Principles of Network Applications - Web and HTTP - Electronic mail - DNS.

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Sub.Code: 25UCA609

Teaching Methods

Smart Class Room/Power point presentation/Seminar/Quiz/Discussion

Text Book

1. Andrew S. Tanenbaum, (2018),"Computer Networks", Fourth Edition - Pearson Education Publication.

Reference Books

1. Kurose, J. F., & Ross, K. W., 2021, Computer Networking: A Top-Down Approach, 8th Edition, Pearson, Boston**.**
2. Behrouz A. Forouzan,(2013), "Data Communications and Network", Second Edition, Tata MCGraw Hill.
3. William A Shay, (2001),"Understanding data communications and Networks" , Second Edition -Vikas Publication.

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong **H** – High **M** – Medium **L** – Low

UCA 59

Sub.Code: 25UCA6Z1

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Core Project - Project and Viva – Voce *****			
Batch	**Hours/Week**	**Total Hours**	**Credits**	**Skill Development** **Employability** **Entrepreneurship**
2025-2028	**4**	**60**	**5**	

Course Objectives

1. Acquire skills to select tasks based on course knowledge.
2. Develop analytical skills for task-solving.
3. Gain confidence by implementing tasks in real projects.
4. Enhance problem-solving strategies through practical application.
5. Improve collaboration and communication skills in team settings.

Course Outcomes (CO)

K3 to K5	CO1	Apply the programming skills for solving the project.
	CO2	Analyze the task and to collect the necessary information about the software.
	CO3	Evaluate the task based on the software.
	CO4	Test the project for its successful implementation
	CO5	Implement and Maintain the developed system.

Guidelines to the Distribution of Marks:

Knowledge Level	**Particulars**		**Marks**	**Total**
K3	**CIA**	**Review**	**15**	**20**
		Regularity	**05**	
	ESE	**Project report ***	**60**	**80**
		Viva –Voce *	**20**	

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Sub.Code:25UCA6Z1

* Both Internal and External Examiners shall evaluate Project & Viva-Voce jointly

Teaching Methods

Power Point Presentation/Project Demo

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	S	H	S
CO2	S	M	M	H	H
CO3	S	H	S	H	H
CO4	S	S	S	S	S
CO5	S	S	S	H	H

S – Strong **H** – High **M** – Medium **L** – Low

ELECTIVE PAPERS

UCA 61

Programme code:10	Bachelor of Computer Applications			
Title of the Paper- Major Elective – Big Data and Analytics				
Batch **2025- 2028**	**Hours/Week** **5**	**Total Hours** **75**	**Credits** **5**	**Employability** **Skill Development**

Course Objectives

1. To Grasp Big Data fundamentals, key concepts, and adoption drivers.
2. To Analyze security, privacy, governance, and lifecycle in Big Data.
3. To Study NoSQL databases and distributed file storage.
4. To Work with MapReduce, event stream processing, and modern storage.
5. To Perform data mining, ML, statistical analysis, NLP, and visualization.

Course Outcomes(CO)

K1toK5	CO1	Identify the need for Big Data analysis.
	CO2	Develop ability to analyze and process Big Data.
	CO3	Build necessary skills to process Big Data by identifying the use case.
	CO4	Acquire knowledge about Hadoop Ecosystem.
	CO5	Disseminate the new knowledge and implementing to the organization.

Syllabus

UNIT I **(14 Hours)**

Understanding Big Data: Introduction – Concepts and Terminology – Big Data Characteristics -Different types of Data. Business Motivation and Drivers for Big Data Adoption: Marketplace Dynamics – Business Architecture – Business Process management – Information and Communications Technology– Internet ofEverything (IoE).

UNIT II **(16 Hours)**

Big Data Adoption and Planning Considerations: Organization Prerequisites - Data Procurement Privacy - Security - Provenance - Limited Real-time Support - Distinct Performance Challenges - Distinct Governance Requirements - Distinct Methodology – Clouds Big Data

Analytics Lifecycle. **Enterprise Technologies and Big Data Business Intelligence**: Online Transaction Processing (OLTP) - Online Analytical Processing (OLAP) -Extract Transform Load (ETL) – Data Warehouses- Data Marts - Traditional BI - Ad-hoc Reports - Dashboards - Big Data BI- Traditional Data Visualization - Data Visualization for Big Data.

UNIT III **(15 Hours)**

Storing and Analyzing Big Data:Big Data Storage Concepts-Clusters-File Systems and Distributed File Systems - NoSQL – Sharding – Replication - Master-Slave - Peer-to-Peer - Sharding and Replication - Combining Sharding and Master-Slave Replication - Combining Sharding and Peer-to- Peer Replication - CAP Theorem - ACID – BASE. **Big Data Processing Concepts**: Parallel Data Processing - Distributed Data Processing - Hadoop - Processing Workloads - Batch - Transactional –Cluster.

UNIT IV **(15 Hours)**

Processing in Batch Mode - Batch Processing with Map Reduce - Map and Reduce Tasks - Map - Combine - Partition - Shuffle and Sort- Reduce - A Simple Map Reduce Example - Understanding MapReduce Algorithms- Processing in Real time Mode -Speed Consistency Volume(SCV) - Event Stream Processing-Complex Event Processing –Realtime BigData Processing and SCV–Realtime Big Data Processing and Map Reduce. **Big Data Storage Technology**: On-Disk Storage Devices - Distributed File Systems - RDBMS Databases - NoSQL Databases – Characteristics- Rationale – Types - Key-Value - Document- Column-Family - Graph- NewSQL Databases.

UNIT V **(15 Hours)**

In Memory Storage Devices-In-Memory Data Grids-Read-through-Write-through-Write-behind Refresh-ahead- In-Memory Databases. **Big Data Analysis Techniques**: Quantitative Analysis - Qualitative Analysis - Data Mining - Statistical Analysis - A/B Testing - Correlation - Regression -Machine Learning- Classification (Supervised Machine Learning- Clustering (Unsupervised Machine Learning) - Outlier Detection – Filtering - Semantic Analysis – Natural

UCA 63

Language Processing - Text Analytics- Sentiment Analysis – Visual Analysis - Heat Maps- Time Series Plots- Network Graphs-Spatial Data Mapping. ***Denotes Self study.**

Text Book:

1. Thomas Erl,. Wajid Khattak, and Paul Buhler, "Big Data Fundamentals. Concepts, Drivers & Techniques" Pearson Publications,2016.

Reference Books:

1. Seema Acharya and Subhashini C,(2015),"Big Data and Analytics", Wiley Publication.
2. Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman,(2013),"Bigdata for dummies Wiley Publication
3. Tom White,(2015),"Hadoop: The Definitive Guide",O'Rilly Publication.

Teaching Methods

Smart Classroom, Projectors, Discussion

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	M	H	S	S
CO2	M	H	M	S	M
CO3	S	H	M	H	M
CO4	S	M	H	M	S
CO5	H	S	S	S	H

S– Strong **H** – High **M**–Medium **L** –Low

UCA 64

Programme code:10	Bachelor of Computer Applications			
Title of the Paper - Major Elective – Data Mining and Warehousing				
Batch **2025 - 2028**	**Hours/Week** **5**	**Total Hours** **75**	**Credits** 5	**Employability** **Skill Development**

Course Objectives

1. To learn the basic concepts of Data Mining algorithms, methods and tools.
2. To develop and apply critical thinking, problem-solving, and decision-making skills.
3. To discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.
4. To explore the concept of learning as compression of data sets.
5. To understand the principles of data mining, including the significance of noise, redundancy, and the extraction of meaningful patterns from complex data sets.

Course Outcomes(CO)

K1 to K5	**CO1**	Knowing the data mining principles and techniques.
	CO2	Understanding the concept of raw data processing using data mining algorithms.
	CO3	Learning data mining algorithms to build analytical applications.
	CO4	Gaining information's to extract patterns and to solve problems.
	CO5	To develop the ability to communicate the findings from data analysis, including noise and redundancy management.

Syllabus

UNIT I **(15 Hours)**

Expanding Universe of Data- Production Factor-Data Mining-Data Mining versus Query Tools-Data Mining In Marketing*****-Practical Applications. Learning – Self Learning Computer Systems- Machine Learning and Methodology of Science – Concept Learning.

UNIT II **(15 Hours)**

Data Warehouse-Need- Designing Decision Support System-Integration with Data Mining – Client Server and Data Ware Housing – Multi Processing Machines- Cost Justification- Knowledge Discovery Process – Data Selection – Cleaning – Enrichment- Coding.

UNIT III **(15 Hours)**

Data Mining – Preliminary Analysis of the Data Set Using Relational Query Tools – Visualization Techniques – Likelihood and Distance – OLAP Tools – K –Nearest Neighbor– Decision Tree- Association Rule – Neural Networks – **Reporting*-** Different Forms of Knowledge- Ten Golden Rules.

UNIT IV **(15 Hours)**

Developing a data warehouse: Why and how to build a data warehouse? Data warehouse architectural strategies and organizational issues- Design considerations- Data content – *Metadata- Distribution of data- Tools for data warehousing- Performance considerations- crucial decisions in designing a data warehouse- Applications of data warehousing and data mining in government.

UNIT V **(15 Hours)**

Customer Profiling – Predicting Bit Behavior Of Pilots – Learning As Compression Of Data Sets- Content Of Message – Noise And Redundancy – Significance Of Noise – Fussy Data Base- The Traditional Theory Of Relational Data Base – From Relations To Tables – From Keys To Statistical Development Dependencies – Denormalization – Data Mining Primitives.

***denotes Self study**

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Books

1. C.S.R.Prabhu,(2002),"Data Warehousing-concepts, techniques, products and Applications", Second Edition ,Prentice hall of India private limited, New

2. delhi,(Unit-IV)

3. Pieter Adriaans, DolfZantinge,(2001), **"**Data Mining **",** Addison Wesley,(Unit I,II,III&V)

Reference Book

1. Kamthania deepali,(2022)Data Warehousing and Data Mining , First edision , techsar private limited

2 .Margaret H.Dunham,(2003),**"**Data Mining – Introductory and Advanced Topics", Pearson Education

MAPPING

PSO / CO	PSO 1	PSO 2	PSO3	PSO 4	PSO 5
CO1	S	H	S	S	S
CO2	S	H	S	H	M
CO3	S	H	M	S	H
CO4	S	M	S	M	H
CO5	S	H	S	H	M

S– Strong **H** – High **M**–Medium **L** –Low

UCA 67

Programme code:10	Bachelor of Computer Applications			
Title of the Paper : Major Elective– Cloud Computing				
Batch **2025 - 2028**	**Hours/Week** **5**	**Total Hours** **75**	**Credits** 5	**Employability Skill Development**

Course Objective

1. Understand the fundamental principles of cloud computing and its various models.
2. Explore cloud architectures, including the components and delivery models.
3. Gain practical knowledge of cloud storage solutions and their applications.
4. Identify security risks in cloud computing and learn security measures to mitigate these risks.
5. Understand the process of cloud migration and its challenges, along with cloud application development and management.

Course Outcomes (CO)

K1 to K5	CO1	Understand the fundamental concepts of cloud computing, including types and working models.
	CO2	Understand cloud computing architectures, cloud modeling, and the role of virtualization.
	CO3	Understand data storage concepts, cloud storage solutions, and cloud services.
	CO4	Analyze security risks in cloud computing and apply cloud security measures.
	CO5	Understand cloud migration, cloud applications, and the services provided by Microsoft, Google, and Amazon.

Syllabus

UNIT I **(15 Hours)**

Introduction : Definitions – Business Drivers – Technology Innovations – Basic Concepts and Terminology: Cloud – IT Resource – On-Premise –Cloud Consumers and Cloud Providers – Scaling –Cloud Service – Cloud Service Consumer– Goals and Benefits –Risk and Challenges. Fundamentals concepts and Models Roles and Boundaries – Cloud Characteristics – Cloud Delivery Models: Infrastructure-as-a-Service - Platform-as-a-Service – Software-as-a-Service –

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Cloud Deployment Models: Public Clouds – Community Clouds – Private Clouds – Hybrid Clouds – Other Cloud Deployment Models.

UNIT II **(15 Hours)**

Broadband Networks and Internet Architecture: Internet Service Provider – Connectionless Packet Switching – Router Based Interconnectivity – Data Center Technology - Virtualization Technology – Web Technology – Multitenant Technology – Service Technology.

UNIT III **(15 Hours)**

Fundamental Cloud Architecture : Workload Distribution Architecture – Resource Pooling Architecture – Dynamic Scalability Architecture – Elastic Resource Capacity Architecture – Service Load Balancing Architecture – Cloud Bursting Architecture – Elastic Disk Provisioning Architecture – Redundant Storage Architecture – Case Study Examples.

UNIT IV **(15 Hours)**

Load Balanced Virtual Server Instances Architecture – Zero Downtime Architecture – Dynamic Failure Detection and Recovery Architecture – Fundamental Cloud Security: Cloud Security Threats.

UNIT V **(15 Hours)**

Cloud Platforms in Industry: Amazon Web Services –Google AppEngine – Cloud Applications: Scientific Applications – Healthcare: ECG Analysis in Cloud – Biology: Protein Structure Prediction – Business & Consumer Applications: CRM &ERP , Social Networking.

***Self-study and questions for examinations may be taken from the self- study portions also.**

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz /

UCA 69

Text Book

1. Thomas Erl, Zaigham Mahmood and Ricardo Puttini, 2019, "Cloud Computing Concepts, Technology & Architecture", Pearson India Education Services Pvt. Ltd, Twelfth Impression. (Unit I –IV)

2. Rajkumar Buyya, Christian Vecchiola and S.ThamaraiSelvi, 2018, "Mastering Cloud Computing", McGraw Hill Education(India) Pvt. Ltd, Thirteenth reprint. (Unit V)

Reference Book

1. Kumar Saurabh, 2011, "Cloud Computing – Insights into New Era Infrastructure", Wiley Indian Edition.

2. Kaittwang Geoffrey C.Fox and Jack J Dongrra, 2012, "Distributed and Cloud Computing", Elsevier.

3. Michael Miller,2008, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing.

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	S	M	M	M
CO2	S	H	M	M	M
CO3	M	M	H	S	M
CO4	M	M	S	H	S
CO5	M	M	M	S	H

Mapping

S– Strong **H** –High **M**–Medium **L**–Low

UCA 70

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper Major Elective - Internet of Things				
Batch **2025-2028**	**Hours/ Week** **5**	**Total Hours** **75**	**Credits** **5**	**Employability and Skill Development**

Course Objective

1. To learn the concepts of IOT and its protocols.
2. To Learn IEEE standards.
3. To learn how to analysis the data in IOT.
4. To analyse the industrial needs
5. To develop IOT infrastructure for popular applications.

Course Outcomes (CO)

K1 to K5	CO1	Analyzing and evaluate the data received through sensors in IOT.
	CO2	Design and develop smart city in IoT
	CO3	Analyze various communication protocols for IoT.
	CO4	Analyze applications of IoT in real time scenario
	CO5	Evaluate appropriate protocol for communication between IoT.

UNIT I **(14Hours)**

Introduction to IoT-Genesis of IoT-IoT and Digitization-IoT Impact-Convergence of IT and OT-IoT Challenges- **Comparing IoT Architectures**: oneM2M, IoT World Forum (IoTWF - Additional IoT Reference Models. – Sensors, Actuators, Smart Objects.

UNIT II **(15 Hours)**

IoT Protocols: IoT Access Technologies: Physical and MAC layers topologyand Security of IEEE 802.15.4, 802.15.4g and LoRaWAN **Application Layer Protocols:**CoAP and MQTT.

UCA 71

UNIT III **(16 Hours)**

Design and Development: Design Methodology- Embedded computing logic- Microcontroller, System on Chips- IoT system building blocks- Arduino- Board details, IDE programming- Raspberry Pi - introduction.

UNIT IV **(16 Hours)**

Data Analytics for IoT: Structured Vs Unstructured DataandDatainMotionVsDatainRest– RoleofMachineLearning–NoSQLDatabases– Hadoop Ecosystem– Python Web Application Framework.

UNIT V **(14 Hours)**

Case Studies/Industrial Applications: Cisco IoT system - IBM Watson IoT platform– Manufacturing-Home Automation, Smart Agriculture -*Smart Parking Architecture and Smart Traffic Control system.

***Self study and questions for examinations may be taken from the self study portions also**

Teaching Methods

Smart classroom/Powerpoint presentation/Seminar/Quiz/ Discussion

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.

Reference Books

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 ofThings – Key applications and Protocols‖, Wiley.

3. Honbo Zhou (2012), “The Internet of Things in the Cloud: A Middleware Perspective”, CRC Press.

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Mapping

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

S–Strong **H**–High **M**–Medium **L** –Low

UCA 73

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper: Major Elective – Block Chain				
Batch 2025-2028	**Hours / Week 5**	**Total Hours 75**	**Credits 5**	**Skill Development Employability Entrepreneurship**

Course Objectives

1. To introduce the Distributed Database and Cryptography.
2. To Introduce technical aspects of public distributed ledgers, block chain systems, Crypto currencies and smart contracts.
3. Students will learn how these systems are built, how to interact with them, how to design and build secure distributed applications.
4. To introduce Bitcoin Protocols.
5. To introduce Case studies and applications of Block chain

Course Outcomes (CO)

K1 to K5	CO1	Stating block chain technologies basics are made possible through learning Distributed Database and various types of database.
	CO2	Stating the Mining strategies followed in block chain teach the basic architecture behind the perfect building of block chain for industries.
	CO3	Classifying the limitations and proofs are another essential part of block chain technology, which are learned for betterment of creating block chain.
	CO4	Describing the history behind the block chain and learning about Vulnerability, Attacks and Side chain gives an additional support for creating a secured block chain.
	CO5	Design a method for solving a problem case study with different perspective.

Syllabus

UNIT I **(15 Hours)**

Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing

UCA 74

Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof positions.

UNIT II **(15 Hours)**

Introduction, Advantage over conventional distributed database, Block chain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, **Life of Blockchain application***, Soft & Hard Fork, Private and Public block chain.

UNIT III **(15 Hours)**

Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate. History, Distributed Ledger, **Bitcoin protocols*** - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Name coin.

UNIT IV **(15 Hours)**

Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and **future of block chain***.

UNIT V **(15 Hours)**

Case study on Naive Block chain construction, Memory Hard algorithm – Hash cash implementation, Direct Acyclic Graph, Play with Go-ethereum, Smart Contract Construction, Toy application using Block chain, Mining puzzles.

*** Self Study and questions for examinations may be taken from the self study portions also.**

Teaching Methods

Smart classroom / PowerPoint presentation / Seminar / Quiz / Discussion/ Flipped Class

Text Book

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, **Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction**, Princeton University Press (July 19, 2016).

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REFERENCEBOOKS

1. Draft version of "S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan, **Block Chain Technology: Cryptocurrency and Applications**, Oxford University Press, 2019.

2. Josh Thompson, **Block chain: The Block chain for Beginnings**, **Guide to Block chain Technology and Block chain Programming**, Create Space Independent Publishing Platform, 2017.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	M	S	H	H	S
CO4	S	M	S	M	H
CO5	S	S	M	H	S

S – Strong **H** – High **M** – Medium **L** – Low

UCA 76

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	**Major Elective - Software Project Management**			
Batch **2025-2028**	**Hours/ Week** **5**	**Total Hours** **75**	**Credits** **5**	**Employability and Skill Development**

Course Objectives

1. Understand the core principles of Software Project Management.
2. Learn various methods and techniques used in project management.
3. Perform scheduling, tracking, risk analysis, quality management, and cost estimation using appropriate techniques.
4. Explore different Product and Project Life Cycle models including Waterfall, Prototype, RAD, and Spiral.
5. Gain knowledge in Software Quality Assurance, its tools, practices, and organizational roles.

Course Outcomes (CO)

K1 TO K5	CO1	Understand the fundamentals of Software Project Management, including its phases and various life cycle models.
	CO2	Apply project planning techniques such as scheduling, tracking, risk management, and cost estimation.
	CO3	Evaluate software quality standards, the role of SQA, and associated tools and challenges.
	CO4	Analyze software requirements, estimation techniques, and the challenges of requirements management.
	CO5	Manage software maintenance activities, including configuration management and performance metrics.

Syllabus

UNIT I **(Hours 15)**

Product Life Cycle: Introduction – Idea generation – Prototype development Phase –Alpha phase – Beta phase – Production phase – Maintenance and obsolescence Phase. **Project Life Cycle models:** What is Project Life Cycle Model? -A Framework for studying different life cycle

models – The Waterfall model*– The prototyping model – RAD model – The Spiral model and its variants.

UNIT II **(Hours: 15)**

Software Quality Assurance: How do you define quality? -Why is quality important in software? – Quality Control and Quality Assurance – Cost and benefits of quality – Software quality analyst's functions– Some popular misconceptions about the SQA's role-Software quality assurance tools –Organizational structures – Profile of a successful SQA.

UNIT III **(Hours: 15)**

Software requirements gathering: Dimensions of requirements gathering –Steps to be followed during requirements gathering –Outputs and quality records from the requirements phase – Skills sets required during the requirements phase-Challenges during the requirements management phase- Metrics for the requirements phase.

UNIT IV **(Hours 15)**

Design and development phase: Salient features of design – Design for reusability – Technology choices /constrains – Design to standards – Design for portability – User interface issues –Challenges during design and development phases-Skill sets for design and development- Metrics for design and development phases.

UNIT V **(Hours 15)**

Project Management in the Maintenance Phase: Introduction – Activities during the maintenance phase-Management issues during the maintenance phase- Configuration management during the maintenance phase – Skill sets for people in the Maintenance phase - Metrics for the Maintenance phase.

Teaching Methods

PowerPoint Presentation, Assignment, Case Study, Seminar

Text Book

1. GobalswamyRamesh,(2007), **"**Managing Global Software Projects**"**, Tata McGraw Hill Publishing Company.

2. Dutt, Chandramouli, "Software Project Management" Pearson India, 2015

Reference Books

1.S.A. Kelkar, (2003),"Software Project Management – A Concise study", PHI.

2. Milk Cotterel, Bob Hughes,(1955), "Software project Management", Inclination/Thomas Computer press.

3. Derrel Ince, H. Sharp and M. Woodman, (1995), "Introduction to software project management and quality assurance", Tata McGraw Hill.

4. Stephen H. Kan, "Metrices and Models in Software Quality Engineering", Second Edition , Pearson Education Asia.

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	H	M	S	S
CO2	S	S	H	H	H
CO3	H	H	S	H	M
CO4	S	M	H	S	S
CO5	M	S	M	H	H

S – Strong **H** – High **M** – Medium **L** – Low

SKILL BASED SUBJECTS

UCA 79

Sub.Code:25UGC3S1

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Skill Based Subject 1 – Cyber Security**			
Batch	**Hours/ Week**	**Total Hours**	**Credits**	**Employability and Skill Development**
2025-2028	**2**	**30**	**3**	

Course Objectives

1. The course introduces the basic concepts of Cyber Security.
2. To develop an ability to understand about various modes of Cyber Crimes and Preventive measures.
3. To understand about the Cyber Legal laws and Punishments.

Course Outcomes (CO)

K1 to K5	CO1	To Understand the Concepts of Cybercrime and Cyber Frauds
	CO2	To Know about Cyber Terrorism and its preventive measures
	CO3	To Analyze about the Internet, Mobile Phone and E-commerce security issues
	CO4	To Understand about E-mail and Social Media Issues
	CO5	To Describe about various legal responses to Cybercrime

Syllabus

UNIT I (6 Hours)

Introduction to Cyber Security: Definition of Cyber Security- Why is Cyber Security important? Layers of Cyber Security- Evolution of Cyber Security. Cyber hacking - Cyber fraud: Definition- Different modes of cyber fraud - Cyber fraud in India. Cyber pornography.

UNIT II (6 Hours)

Cyber Terrorism: Modes of cyber terrorism. Cybercrime: What is Cybercrime? Cybercrime preventive methods - Preventive steps for individuals & organizations - Kinds of cybercrime - Malware and its types – Cyber-attacks.

UCA 80

Sub.Code:25UGC3S1

UNIT III **(6 Hours)**

Internet Mobile Phone and E-commerce Security issues: Data theft - Punishment of data theft- Theft of internet hours - Internet safety tips for children & parents. Mobile phone privacy- E-Commerce security issues.

UNIT IV **(6 Hours)**

Email and Social media issues: Aspects of Social Media - The Vicious Cycle of unhealthy social media use- Modifying social media use to improve mental health. Computer Virus - Antivirus – Firewalls.

UNIT V **(6 Hours)**

Cyber Forensics and Digital Evidence: What does Digital Footprint Mean? - Web Browsing and Digital Footprints- Digital Footprint examples – How to Protect Your Digital Footprints? - How to erase your Footprints? - Browser Extensions and Search Engine Deletion - Cyber Crime and Cyber Laws - Common Cyber Crimes and Applicable Legal Provisions: A Snapshot - Cyber Law (IT Law) in India – The Information Technology Act of India 2000 - Cyber Law and Punishments in India - Cyber Crime Prevention guide to users – Regulatory Authorities.

Teaching Methods

Chalk and Talk, Presentation, Seminar, Quiz, Discussion&Assignment

Text Book

1. "Cyber Security", Text Book prepared by "Kongunadu Arts and Science College", Coimbatore -29, 2022.

Reference Books

1. Mayank Bhushan, Rajkumar Singh Rathore, Aatif Jamshed, "Fundamental of Cyber Security", BPB Publications, 1st Edition, 2017.
2. Anand Shinde, "Introduction to Cyber Security-Guide to the world of Cyber Security",Notion Press,2021.
3. Paul Grishman, "Cyber Terrorism- The use of the Internet for Terrorist Purpose",Axis Publication,1st Edition 2010.

4. Shilpa Bhatnagar, "Encyclopaedia of Cyber and Computer Hacking", Anmol Publications, 1st Edition 2009.

Web References

1. http://deity.gov.in/ - Department of Electronics and Information Technology, Govt. of India
2. http://cybercellmumbai.gov.in/ - Cybercrime investigation cell
3. http://ncrb.gov.in/ - National Crime Records Bureau
4. http://catindia.gov.in/Default.aspx - Cyber Appellate Tribunal
5. http://www.cert-in.org.in/ - Indian Computer Emergency Response Team
6. http://cca.gov.in/rw/pages/index.en.do - Controller of Certifying Authorities
7. www.safescrypt.com - Safes crypt
8. www.nic.in – National Informatics Centre
9. https://www.kaspersky.com/resource-center/definitions/what-is-a-digital-footprint
10. https://geekflare.com/digital-footprint/

Question Paper Pattern

Duration: 3 hrs **Max: 75 marks**

Section - A (10x1=10)

Choose the correct answer

Section - B (5x5=25)

Short answer questions, either or type, one question from each unit.

Section - C (5x8=40)

Essay answer questions, either or type, one question from each unit.

UCA 82

Sub.Code:25UGC3S1

CIA EXAMINATION MARK BREAKUP

S. NO	DISTRIBUTION COMPONENT	MARKS
1.	CIA I – 75 Marks Converted to 30	**30**
2.	CIA II – 75 Marks Converted to 30	**30**
3.	Assignment I	**10**
4.	Assignment II	**10**
5.	Attendance	**05**
6.	Any Case Study related to Cyber Security	**15**
	Total	**100**

UCA 83

Sub.Code:25UCA4SL

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper	**Skill Based Subject II – Professional Development Lab**			
Batch **2025-2028**	**Hours/ Week** **2**	**Total Hours** **30**	**Credits** **3**	**Employability and Skill Development**

Course Objectives

1. To gain knowledge on the concepts of Document Development.
2. To design document and analyse the performance
3. To know the various documentation techniques.
4. To expose the student to learn document standards
5. To know the various presentation techniques.

Course Outcomes (CO)

K1toK5	CO1	Apply the basic concepts of Document creation.
	CO2	Examine the Documentation techniques
	CO3	Analyze the excel formula and performance.
	CO4	Illustrate the Power point Tools
	CO5	Evaluate the ideas and concepts using MS-office.

LIST OF PRACTICAL PROGRAMS

MS-Word:

1. Create and format a document.
2. Working with tables.
3. Working with Bullets and Lists.
4. Working with styles, shapes, smart art, charts.

MS EXCEL:

5. Create worksheets, insert and format data.
6. Work with different types of data: text, currency, date, numeric etc.
7. Split, validate, consolidate, Convert data.

8. Sort and filter data

MS PowerPoint:

9. Formatting slide content and using bullets and numbering.
10. Insert and format images, smart art, tables, charts.
11. Using Slide master, notes and handout master.
12. Working with animation and transitions.

Teaching Methods

Smart Classroom, Projectors, Discussion

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student(3Hours/60Marks)

1. Record Work-10Marks

Particulars	**Program I(Marks)**	**Program II(Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

2. Algorithm,Program,TypingandExecution:45Marks.

Mapping

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

S– Strong **H** – High **M**–Medium **L** –Low

UCA 85

Sub.Code:25UBI6S3

Programme Code:10	*For B.A., BBA, B. Com,* **BCA and** *B.Sc., Degree Students*			
Title of the Paper	**Skill Based Subject - III - Basics of Intellectual Property Right's**			
Batch **2025-2028**	**Hours/ Week** **2**	**Total Hours** **30**	**Credits** **3**	**Skill Development**

Course Objectives

1. To create awareness about recent trends in IPR and Innovation
2. To explore the basic concepts IPR
3. To focus upon trademarks, copyrights, patents, industrial designs and traditional knowledge.
4. To learn more about managing IP rights and legal aspects.

Course Outcomes

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

K1 ↑	CO1	Know about basic concepts of IPR and patent
	CO2	Understand copyrights, industrial designs and geographical indication of goods.
	CO3	Differentiate between trademarks and trade secrets
	CO4	Acquire knowledge on protection of traditional knowledge and plant varieties.
↓ K5	CO5	Manage and protect IP Rights

Syllabus

Unit – I **(6 hours)**

Introduction -origin and development of Intellectual Property Rights (IPR), need for protecting IP, **Patents:** Foundation of patent law, patent searching process, basic criteria of patentability. Patentable and non - patentable subject matters in India. Patent prior art search, drafting the patent specification and filing procedure

Unit – II **(6 hours)**

Copyrights: Fundamentals of copyright law, originality of material, right of reproduction, right to perform the work publicly, copyright ownership issues, notice of copyright. **Industrial**

Sub.Code:25UBI6S3

Designs: Kind of protection provided in Industrial design. **Geographical Indication of Goods:** Basic aspects and need for the registration.

Unit – III **(6 hours)**

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, transfer of rights, selecting and evaluating trademark, registration of trademarks, claims. **Trade Secrets:** Trade secret law, determination of trade secret status, liability form is appropriation of trade secrets, trade secret litigation.

Unit – IV **(6 hours)**

Protection of traditional knowledge - Objectives, concept of traditional knowledge, issues concerning, bioprospecting and biopiracy. **Protection of Plant Varieties -** Objectives, international position, plant varieties protection in India. Rights of farmers, breeders and researchers.

Unit- V **(6 hours)**

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, protecting IP Rights: non-disclosure agreement, cease and desist letter, settlement memorandum. **Transferring IP Rights:** Assignment contract, license agreement, deed of assignment. Infringement and enforcement.

Teaching Methods

Smart Class Room/PowerPoint presentation/Seminar/Quiz/Discussion

Text Books

1. Ramakrishna Chinta kunta and M. Geethavani (2022). A Textbook of Intellectual Property Rights. Blue Hills publications.
2. N.K Acharya (2021).Intellectual property rights(8thEdn). Asia Law House.
3. Craig Allen Nard, Michael J. Madison, and Mark P. McKenna. (2017). Law of Intellectual Property (5thEdn). New York Aspen publishers.
4. Barrett and Margreth (2009). Intellectual Property. New York Aspen publishers.
5. Deborah E.Bouchoux(2013). Intellectual property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets. Publisher: Cengage India.

References

1. B.Ramakrishna and H.S.Anil Kumar (2017). Fundamentals of Intellectual Property Rights: For Students, Industrialist and Patent Lawyers.Notion Press.
2. V. K. Ahuja(2013). Law relating to Intellectual Property rights (2nd Edn). LexisNexis.
2. R. Radhakrishnan and S. Balasubramanian(2008).Intellectual property rights: Text and Cases. Excel Books India.
4. D. Goeland S. Parashar (2013). IPR Biosafety and Bioethics. Pearson Education India.

CIA EXAMINATION MARK BREAKUP

The CIA Examination mark breakup for the course **Basics of IPR** is given below:

S.No.	Distribution Component	Marks
1	CIA I – 75 Marks Converted to 30	30
2	CIA II – 75 Marks Converted to 30	30
3	Assignment I	10
4	Assignment II	10
5	Attendance	05
6	Any Case Study related to IPR (as a Group)	15
	Total	**100**

QUESTION PAPER PATTERN

The following question paper pattern will be followed for the above said courses:

Section A - Multiple Choice (10 × 1 = 10 Marks)

Section B - Either or Type (5 × 5 = 25 Marks)

Section C - Either or Type (5 × 8 = 40 Marks)

Maximum Marks : 75 Duration : 3 Hours

EDC

UCA 88

Sub.Code:25UCA5XL

Programme Code:10	**Bachelor of Computer Applications**			
Title of the Paper : Extra Departmental Course–Internet and Office Automation Lab				
Batch **2025-2028**	**Hours/ Week** **2**	**Total Hours** **30**	**Credits** **3**	**Skill Development Entrepreneurship**

Course Objectives

1. Manage email accounts and communications online.
2. Create professional documents using MS-Word.
3. Use MS-Excel for payroll and mark sheet calculations.
4. Design presentations and promotional materials with MS-PowerPoint.
5. Build and query databases for stock and employee records.

Course Outcomes

K3 to K5	CO1	Understanding and remember various menus in office automation.
	CO2	Implementing the concepts of Internet techniques.
	CO3	Executing various calculations of MS-Excel.
	CO4	Analyzing the applications using MS-PowerPoint.
	CO5	Applying the database components to develop table using MS-Access.

LISTOFPRACTICAL

1. Creation of e-mail Id using Internet.
2. Manipulation of mail by sending and receiving using Internet.
3. Create a mail merge using MS-Word.
4. Prepare Resume using MS-Word.
5. Create a front page for Newspaper using MS-Word.
6. Payroll calculation using MS-Excel.
7. Prepare student marksheet using MS-Excel.
8. Create a slideshow for computer components using MS-PowerPoint.
9. Prepare a photo album using MS-PowerPoint.

10. Promote a brand using MS-PowerPoint.
11. Create a database for stock maintenance and generate report.
12. Create a database for employee and apply query to filter the employee's name that have salary.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student(3Hours/100Marks)

1. Observation – 30 Marks
2. Record Work-5Marks
3. Attendance – 5 Marks
4. Algorithm,Program,Writing and Execution:60Marks.
   (CIA Practical I and II – 60 Marks converted into 30 Marks)

Particulars	**Program I(Marks)**	**Program II(Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

Teaching Methods

Smart Classroom, Projector, Discussion

GENERAL PAPERS
(EVS and MORAL ETHICS)

UCA 90

Sub Code: 25EVS101

For B.A., BBA, B.Com, **BCA** and B.Sc., Degree Students				
PART IV – ENVIRONMENTAL STUDIES				
Batch **2025-2028**	**Semester** **I**	**Hours / Week** **2**	**Total Hours** **30**	**Credits** **2**

COURSE OBJECTIVES

- The course will provide students with an understanding and appreciation of the complex interactions of man, health and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences
- To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
- To shape students into good "Ecocitizens" thereby catering to global environmental needs.
- This course is designed to study about the types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling and principles of environmental pollution such as air, water and soil
- The course will address environmental stress and pollution, their sources in natural and workplace environments, their modes of transport and transformation, their ecological and public health effects, and existing methods for environmental disease prevention and remediation.

COURSE OUTCOMES

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

K1 ↑	CO 1	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities and ecosystems
	CO2	Develop an in depth knowledge on the interdisciplinary relationship of cultural, ethical and social aspects of global environmental issues
	CO3	Acquiring values and attitudes towards complex environmental socio-economic challenges and providing participatory role in solving current environmental problems and preventing the future ones
	CO4	To gain inherent knowledge on basic concepts of biodiversity in an ecological context and about the current threats of biodiversity
↓ K5	CO5	To appraise the major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to human communities and ecosystems

UCA 92

Sub Code: 25EVS101

Syllabus

UNIT I MULTIDISCIPLINARY NATURE OF ENVIRONMENT (6 HOURS)

Definition: scope and importance – Need for public awareness - Natural resources – Types of resources – Forest Resources – Water Resources – Mineral Resources – Food Resources – Energy Resources – Land Resources.

UNIT II ECOSYSTEMS (6 HOURS)

Concept of an ecosystem – Structure and functions of an ecosystem – Procedures, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food web and ecological pyramids – Structure and function of the following ecosystem – Forest Ecosystem –Grassland Ecosystem – Desert Ecosystem – Aquatic Ecosystem.

UNIT III BIODIVERSITY AND ITS CONSERVATION (6HOURS)

Introduction – Definition – Genetic – Species and ecosystem diversity- Bio geographical classification of India – Value of biodiversity – Biodiversity at global, national and local levels – India as a mega - diversity Nation - Hot spot of biodiversity – Threats to biodiversity - Endangered and endemic species of India – Conservation of Biodiversity – *Insitu* Conservation of Biodiversity – *Exsitu* Conservation of Biodiversity

UNIT IV ENVIRONMENTAL POLLUTION (6 HOURS)

Definition - Causes, effects and control measures of : Air Pollution – Water Pollution – Soil Pollution – Marine Pollution – Noise Pollution – Thermal Pollution – Nuclear Pollution – Solid Waste Management: Causes, effects, control measures of urban and industrial wastes – Role of individual in prevention of pollution – Pollution case studies – domestic waste water, effluent from paper mill and dyeing, cement pollution – Disaster Management – Food, Drought, Earthquake, Tsunami, Cyclone and Landslide.

UNIT V SOCIAL ISSUES AND THE ENVIRONMENT (6 HOURS)

Sustainable Development – Smart City, Urban planning, Town Planning , Urban problems related to energy – Water Conservation: Rain Water Harvesting and Watershed Management – Resettlement and rehabilitation of people, its problems and concerns, case studies Narmatha Valley Project – Environmental ethics, issues and possible solutions – Climate change, global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust, case studies – Hiroshima and Nagasaki, Chernobyl – Consumerism and waste products – Environmental Protection Act – Air Pollution Act (Prevention and Control) – Water Pollution Act (Prevention and control) – Wild Life

Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness – Human Population and the environment – Population Growth and Distribution – Population Explosion – Family Welfare Programme – Environment and Human Health – Human Rights – Value Education – HIV/ AIDS – Women and Child Welfare – Role of Information Technology in Environment and Human Health.

UCA 92

Sub Code: 25EVS101

Teaching Methods

- Smart Class Room/Powerpoint presentation/Seminar/Quiz/Discussion

Text Book

1.P.Arul, A Text Book of Environmental Studies, Environmental Agency, No 27, Nattar street, Velacherry main road, Velacheery, Chennai – 42, First Edition, Nov.2004.

References

1. Purohit Shammi Agarwal, A text Book of Environmental Sciences, Publisher Mrs.Saraswati Prohit, Student Education , Behind Naswan Cinema Chopansi Road, Jodhpur.

2. Dr.Suresh and K.Dhameja, Environmental Sciences and Engineering , Publisher S.K.Kataria & Sons, 424/6, Guru Nanak Street, Vaisarak, Delhi -110 006.

3. J.Glynn Henry and Gary W Heinke, Environmental Science and Engineering, Prentice Hall of India Private Ltd., New Delhi – 110 001

Question Paper Pattern

Duration: 3 hours **Total Marks: 50**

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

UCA 93

Sub.Code:25VED201

Programme Code:		For B.A., BBA, B.Com, **BCA** and B.Sc., Degree Students		
VALUE EDUCATION – MORAL AND ETHICS				
Batch 2025-2028	**Semester II**	**Hours / Week** 2	**Total Hours** 30	**Credits 2**

COURSE OBJECTIVES

- To impart Value Education in every walk of life.
- To help the students to reach excellence and reap success.
- To impart the right attitude by practicing self-introspection.
- To portray the life and messages of Great Leaders.
- To insist the need for universal brotherhood, patience and tolerance.
- To help the students to keep them fit.
- To educate the importance of Yoga and Meditation.

COURSE OUTCOMES (CO)

After Completion of the Course the student will be able to

K1 ↕ K5	CO1	will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	CO2	will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	CO3	can emulate the principled life of great warriors and take it forward as a message to self and the society
	CO4	will be able to Analyse the Practical outcome of practicing Moral values in real life situation
	CO5	could Evaluate and Rank the outcome of the pragmatic approach to further develop the skills

SYLLABUS

UNIT I **(4 Hours)**

Moral and Ethics: Introduction – Meaning of Moral and Ethics – Social Ethics – Ethics and Culture – Aim of Education.

UNIT II **(6 Hours)**

25VED201

Life and Teachings of Swami Vivekananda: Birth and Childhood days of Swami Vivekananda – At the Parliament of Religions – Teachings of Swami Vivekananda

UCA 94

Sub.Code:25VED201

UNIT III **(4 Hours)**

Warriors of our Nation: Subhas Chandra Bose – Sardhar Vallabhbhai Patel – Udham Singh – V. O. Chidambaram Pillai – Bhagat Singh – Tiruppur Kumaran – Dheeran Chinnamalai – Thillaiaadi Valliammai – Velu Nachiyar – Vanchinathan.

UNIT IV **(8 Hours)**

Introduction -yoga and its benefits - Ardhasiddhasana- Yoga for peace- Yoga for health - Yoga for wellbeing - Yoga for success - Brain yoga benefits - The science of Yoga.

UNIT V **(8 Hours)**

Isha kriya -Surya Shakthi and it's benefits.

Teaching Methods

Smart Class Room/PowerPoint presentation/Seminar/Quiz/Discussion

Text Books

- Value Based Education – Moral and Ethics – compiled by Kongunadu Arts and Science College (Autonomous), 3rd Edition (2024).

Reference Books

1. Swami Vivekananda - A Biography, Swami Nikhilananda, Advaita Ashrama, India, 24th Reprint Edition (2010).
2. Gandhi, Nehru, Tagore and other eminent personalities of Modern India, Kalpana Rajaram, Spectrum Books Pvt. Ltd., revised and enlarged edition(2004).
3. Freedom Fighters of India, Lion M.G. Agrawal, Isha Books Publisher, First Edition (2008).
4. Easy steps to Yoga by Swami Vivekananda, A Divine Life Society Publication(2000).

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Question Paper Pattern

Duration: 3 hours **Total Marks: 50**

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

NON- MAJOR ELECTIVE

UCA 95

Sub.Code: 25UHR3N1

ProgrammeCode:	For B.A., BBA, B.Com, **BCA** and B.Sc., Degree Students		
PART IV–NONMAJORELECTIVE–I HUMANRIGHTS			
Batch	**Hours/ Week**	**TotalHours**	**Credits**
2025-2028	**2**	**30**	**2**

Course Objectives

1. To prepare for responsible citizenship with awareness of the relationship between Human Rights, democracy and development.
2. To impart education on national and international regime on Human Rights.
3. To sensitive students to human suffering and promotion of human life with dignity.
4. To develop skills on human rights advocacy
5. To appreciate the relationship between rights and duties
6. To foster respect for tolerance and compassion for all living creature.

Course Outcomes

After Completion of the Course the student will be able to

K1 ↑ ↓ K5	CO1	To understand the hidden truth of Human Rights by studying various provisions in the Constitution of India.
	CO2	To acquire overall knowledge regarding the Feminist perspectives in the Liberative Empowerment of Women.
	CO3	To gain knowledge about various gender roles and stereotypes involved in the comprehension of gender equality and women's rights.
	CO4	To comprehend the legal provisions and policies that foreground the safety of children in the society and to promote awareness.
	CO5	To gain enhanced knowledge about sexual and gender minorities to recognize, celebrate and acknowledge the diversified forms of gender expressions and rights.

SYLLABUS

UNIT I **(6 Hours)**

HUMAN RIGHTS HUMANS RIGHTS CONSTITUTION OF INDIA: Humans Rights - Constitution Of India.

UNIT II **(6 Hours)**

WOMEN EMPOWERMENT IN INDIA: Feminism And Sexual Violence - Women And Liberation

Sub.Code: 25UHR3N1

UNIT III **(6 Hours)**

GENDER EQUALITY AND WOMEN'S RIGHTS: Stereotype Gender Roles - Women's Education, Power And Science

UNIT IV **(6 Hours)**

RIGHTS OF THE CHILD IN INDIA: Status of child in contemporary Indian society - Special Laws and Policies for protection of children

UNIT V **(6 Hours)**

SOGIESC RIGHTS: Understanding SOGIESC- basic Definitions- inclusivity of SOGIESC-importance of studying SOGIESC- presence of SOGIESC in Indian Traditions- temples and cultural practices that exemplify SOGIESC in India- Genetics of Sex determination- Genetics of Intersex community- Successful SOGIESC Personalities and achievers – Alan Turing- Sally Ride- Leonardo da vinci- Alan Hart- Virginia -Woolf- Bayard Rustin- Padmini Prakash- AkkaiPadmashali- K PrithikaYashini- Laxmi Narayan Tripati- Madhu Bai Kinnar- ManabiBandhopadhyay- SOGIESC Rights and laws

Teaching Methods

Smart Class Room/PowerPoint presentation/Seminar/Quiz/Discussion

Books for Study:

1. Human Rights (2024) Compiled by Kongunadu Arts and Science College, Coimbatore –29.

REFERENCES:

1. Human Rights, (2018) by Jaganathan, MA.,MBA.,MMM.,ML.,ML., (Humanitarian Law) and J.P. Arjun

Proprietor: Usha Jaganathan, Refugee Law

Law series, 1st floor, NarmathaNanthi Street, Magathma Gandhi Nagar, Madurai – 625014.

2. Country Report on SOGIESC Rights In India: An Unfinished Agenda.

Weblink: https://www.ilgaasia.org/publications/india-country-report-an-unfinished-agenda

3. Intersex.

Weblink: https://my.clevelandclinic.org/health/articles/16324-intersex

4. SOGIESC Personalities:

https://www.bbc.com/news/world-asia-india-29357630

https://en.wikipedia.org/wiki/Laxmi_Narayan_Tripathi

https://en.wikipedia.org/wiki/Akkai_Padmashali

https://www.indiatoday.in/india/story/prithika-yashini-india-first-transgender-police-officer-tamil-nadu-969389-2017-04-04

https://yourstory.com/2018/03/first-transgendre-college-principal-west-bengal

5. SOGIESC Rights and laws

https://www.openglobalrights.org/lgbtqia-to-sogiesc-reframing-sexuality-gender-human-rights/

https://static1.squarespace.com/static/5a84777f64b05fa9644483fe/t/625ead0484f9005d75b92 dd0/1650371887436/ILGA+Asia+India+Report+2021.pdf

Question Paper Pattern

Duration: 3 hrs **Max: 75 marks**

Section - A(5x5=25)

Short answer questions, either or type, one question from each unit.

Section - B(5x10=50)

Essay answer questions, either or type, one question from each unit.

UCA 98

Sub.Code :25UWR4N2

Programme Code:	For B.A., BBA, B.Com, **BCA** and B.Sc., Degree Students		
	Part IV -NON- MAJOR ELECTIVE – II WOMEN'S RIGHTS		
Batch 2025-2028	**Hours / Week 2**	**Total Hours 30**	**Credits 2**

Course Objectives

1. To know about the laws enacted to protect Women against violence.
2. To impart awareness about the hurdles faced by Women.
3. To develop a knowledge about the status of all forms of Women to access to justice.
4. To create awareness about Women's rights.
5. To know about laws and norms pertaining to protection of Women.
6. To understand the articles which enables the Women's rights.
7. To understand the Special Women Welfare laws.
8. To realize how the violence against Women puts an undue burden on healthcare services.

Course Outcomes

After Completion of the Course the student will be able to

K1	CO1	Appraise the importance of Women's Studies and incorporate Women's Studies with other fields
↕	CO2	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication
	CO3	Interpret the laws pertaining to violence against Women and legal consequences
	CO4	Contribute to the study of the important elements in the Indian Constitution, Indian Laws for Protection of Women
K5	CO5	Spell out and implement Government Developmental schemes for women and create awareness on modernization and impact of technology on Women

Syllabus

Unit I **(6 Hours)**

Women's Studies: Basic concepts of Women's studies in Higher education, Women's studies perspectives- Socialization- Patriarchy- Women's studies as an academic discipline- Growth and development of Women's studies as a discipline internationally and in India.

Unit II **(6 Hours)**

Socio-Economic Development of Women: Family welfare measures, role of Women in economic development, representation of Women in media, status of Women land rights, Women Entrepreneurs, National policy for the empowerment of women.

Sub.Code :25UWR4N2

Unit III **(6 Hours)**

Women's Rights – Access to Justice: Crime against Women, domestic violence – physical abuse- verbal abuse – emotional abuse - economic abuse – minorities, dowry- harassment and death, code of conduct for work place, abetment of suicide.

Unit IV **(6 Hours)**

Women Protective acts: Protective legislation for Women in the Indian constitution- Anti dowry, SITA, PNDT, and Prevention Sexual Harassment at Workplace (Visaka case), Domestic violence (Prevention) Act.

Unit V **(6 Hours)**

Women and Child welfare: Safety provisions - various forms of mass media, radio, visual, internet, cyber space, texting, SMS and smart phone usage. Healing measures for the affected Women and child society by private and public sector, NGO and society.

Teaching Methods

Smart Class Room / Power point Presentation / Seminar / Quiz / Discussion / Flipped Class

Text Book

1. **Women's Rights** (2021), compiled by Kongunadu Arts & Science College, Coimbatore – 641 029.

Reference Book

1. **"Rights of Indian Women"** by Vipul Srivatsava. Publisher: Corporate Law Advisor, 2014.
2. **"Women's security and Indian law"** by Harsharam Singh. Publisher: Aabha Publishers and Distributors, 2015.
3. **"Women's Property Rights in India"** by Kalpaz publications, 2016.

QUESTION PAPER PATTERN

Duration: 3 Hours **Max. Marks: 75**

SECTION A (5 x 5 = 25 marks)

Short answers, either or type, one question from each unit.

SECTION B (5 x 10 = 50 marks)

Essay type questions, either or type, one question from each unit.

UCA 100

Programme Code :	For B.A., B.Sc., and **BCA** Degree Students		
PART IV - NON- MAJOR ELECTIVE III - CONSUMER AFFAIRS			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2025-2028	**2**	**30**	**2**

Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints.
3. To know more about decisions on Leading Cases by Consumer Protection Act.
4. To get more knowledge about Organizational set-up under the Consumer Protection Act
5. To impart awareness about the Role of Industry Regulators in Consumer Protection
6. To understand Contemporary Issues in Consumer Affairs

Course Outcomes

K5	CO1	Able to know the rights and responsibility of consumers.
↕	CO2	Understand the importance and benefits of Consumer Protection Act.
↕	CO3	Applying the role of different agencies in establishing product and service standards.
↕	CO4	Analyze to handle the business firms' interface with consumers.
K1	CO5	Assess Quality and Standardization of consumer affairs

Syllabus

UNIT I **(6 Hours)**

Conceptual Framework - Consumer and Markets: Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, E-Commerce with reference to Indian Market, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labeling and packaging along with relevant laws, Legal Metrology. Experiencing and Voicing Dissatisfaction: Consumer buying process, Consumer Satisfaction/dissatisfaction-Grievances-complaint, Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process: ISO 10000suite

UCA 102

UNIT II **(6 Hours)**

The Consumer Protection Law in India - Objectives and Basic Concepts: Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, restrictive trade practice.
Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels; Adjudicatory Bodies: District

UNIT III **(6 Hours)**

Grievance Redressal Mechanism under the Indian Consumer Protection Law - Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.
Leading Cases decided under Consumer Protection law by Supreme Court/National Commission: Medical Negligence; Banking; Insurance; Housing & Real Estate; Electricity and Telecom Services; Education; Defective Products; Unfair Trade Practices.

UNIT IV **(6 Hours)**

Role of Industry Regulators in Consumer Protection

i. Banking: RBI and Banking Ombudsman

ii. Insurance: IRDA and Insurance Ombudsman

iii. Telecommunication: TRAI

iv. Food Products: FSSAI

v. Electricity Supply: Electricity Regulatory Commission

vi. Real Estate Regulatory Authority

UNIT V **(6 Hours)**

Contemporary Issues in Consumer Affairs - Consumer Movement in India: Evolution of Consumer Movement in India, Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer

Helpline, Comparative Product testing, Sustainable consumption and energy ratings.
Quality and Standardization: Voluntary and Mandatory standards; Role of BIS, Indian Standards

Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance; Role of International Standards:

ISO an Overview.

Note: Unit 2 and 3 refers to the Consumer Protection Act, 2086. Any change in law would be added appropriately after the new law is notified.

Teaching Methods

Smart Class rooms /Power Point Presentations / Seminars/Quiz /Discussion /Flipped Classrooms

SUGGESTED READINGS

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, UniversitiesPress.
2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications PvtLtd.
3. G. Ganesan and M. Sumathy. (2012). Globalisation and Consumerism: Issues and Challenges, RegalPublications
4. Suresh Misra and Sapna Chadah (2012). Consumer Protection in India: Issues and Concerns, IIPA, NewDelhi
5. Rajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company
6. Girimaji, Pushpa (2002). Consumer Right for Everyone Penguin Books.
7. E-books :-www.consumereducation.in
8. Empowering Consumers e-book,www.consumeraffairs.nic.in
9. ebook,www.bis.org
10. The Consumer Protection Act, 2086 and its later versions.

UCA 103

Question paper pattern

Duration: 3 hrs. **Max: 75 Marks**

Section A (5 x 5=25)

Short notes

Either – or / type – question from each unit.

Section B (5 x 10=50)

Essay type

Either – or / type – question from each unit.

UCA 104

Sub. Code: 25UHW401

Programme Code:10	**Bachelor of Computer Applications**	
Title of the Paper: HEALTH AND WELLNESS		
Batch 2025 – 2028	Semester IV	Credits 2

Skill Areas:

Physical Fitness, Nutrition, Mental Health, Awareness on Drug addiction and its effects.

Purpose:

The Health & Wellness course focuses on teaching the elements of physical, mental, emotional, social, intellectual, environmental well-being which are essential for overall development of an individual. The course also addresses the dangers of substance abuse and online risks to promote emotional and mental health.

Learning Outcomes:

Upon completion of the Health & Wellness course, students will be able to:

1. Demonstrate proficiency in sports training and physical fitness practices.
2. Improve their mental and emotional well-being, fostering a positive outlook on health and life.
3. Develop competence and commitment as professionals in the field of health and wellness.
4. Awareness on drug addiction and its ill effects

Focus:

During the conduct of the Health & Wellness course, the students will benefit from the following focus areas:

1. Stress Management.
2. Breaking Bad Habits.
3. Improving Interpersonal Relationships.
4. Building Physical Strength & Inner Strength.

UCA 105

Sub. Code: 25UHW401

Role of the Facilitator:

The faculty plays a crucial role in effectively engaging with students and guiding them towards achieving learning outcomes. Faculty participation involves the following areas:

1. **Mentorship & Motivation:** The Facilitator mentors students in wellness and self-discipline while inspiring a positive outlook on health. Faculty teach stress management, fitness, and daily well-being.

2. **Promoting a Safe and Inclusive Environment:** The facilitator ensures a safe, inclusive, and respectful learning environment for active student participation and benefit.

3. **Individualized Support and Monitoring Progress:** The facilitator plays a crucial role in providing personalized support, monitoring and guidance to students.

Guided Activities

In this course, several general guided activities have been suggested to facilitate the achievement of desired learning outcomes. They are as follows:

1. Introduction to Holistic Well-being.
2. Holistic Wellness Program- Nurturing Body and Mind
3. Breaking Bad Habits Workshop.
4. Improving the elements of physical, emotional, social, intellectual, environmental and mental well-being.
5. Creating situational awareness, digital awareness.
6. Understanding substance abuse, consequences and the way out.

Period Distribution

The following are the guided activities suggested for this Audit course.

The Physical Director should plan the activities by the students.

Arrange the suitable Mentor/Guide for the wellness activities.

Additional activities and programs can be planned for Health and Wellness.

UCA 106

Sub. Code: 25UHW401

S.No.	Guided Activities	Period

1 **Introduction to Holistic Well-being**

1. Introduce the core components of Health & Well-being namely Physical, mental and emotional well-being.
2. Provide worksheets on all the four components individually and explain the interconnectedness to give an overall understanding.

2 **Wellness Wheel Exercise (Overall Analysis)**

- Guide students to assess their well-being in various life dimensions through exercises on various aspects of wellbeing and explain the benefits of applying wellness wheel.
- Introduce Tech Tools.
- Explore the use of technology to support well-being.
- Introduce students to apps for meditation, sleep tracking or healthy recipe inspiration.

3 **Breaking Bad Habits (Overall Analysis)**

- Open a discussion on bad habits and their harmful effects.
- Provide a worksheet to the students to identify their personal bad habits.
- Discuss the trigger, cause, consequence and solution with

examples. Guide them to replace the bad habits with good ones through worksheets.

4 **Physical Well-being**

1.Fitness

Introduce the different types of fitness activities such as basic exercises, cardiovascular exercises, strength training exercises, flexibility exercises, so on and so forth.

(Include theoretical explanations and outdoor activity).

2.Nutrition

Facilitate students to reflect on their eating habits, their body type, and to test their knowledge on nutrition, its sources and the benefits.

3. Yoga & Meditation

Discuss the benefits of Yoga and Meditation for one's overall health.

Demonstrate different yoga postures and their benefits on the body through visuals (pictures or videos)

4. Brain Health

Discuss the importance of brain health for daily life.

Habits that affect brain health (irregular sleep, eating, screen time).
Habits that help for healthy brains (reading, proper sleep, exercises).
Benefits of breathing exercises and meditation for healthy lungs.

5. Healthy Lungs

Discuss the importance of lung health for daily life.
Habits that affect lung health (smoking, lack of exercises).
Benefits of breathing exercises for healthy lungs.

6. Hygiene and Grooming

Discuss the importance of hygienic habits for good oral, vision, hearing and skin health.
Discuss the positive effects of grooming on one's confidence level and professional growth.

Suggested Activities (sample);

Nutrition:

Invite a nutritionist to talk among the students on the importance of nutrition to the body or show similar videos shared by experts on social media. Organize a 'Stove less/fireless cooking competition' for students where they are expected to prepare a nutritious dish and explain the nutritive values in parallel.

UCA 108

Sub. Code: 25UHW401

5 **Emotional Well-being**

1.Stress Management

Trigger a conversation or provide self-reflective worksheets to identify the stress factors in daily life and their impact on students' performance.

Introduce different relaxation techniques like deep breathing, progressive muscle relaxation, or guided imagery.

(use audio recordings or visuals to guide them through these techniques).

After practicing the techniques, have them reflect on how these methods can help manage stress in daily life.

1. Importance of saying 'NO'.

Explain the students that saying 'NO' is important for their Physical and mental well-being, Academic Performance, Growth and Future, Confidence, Self-respect, Strong and Healthy Relationships, building reputation for self and their family (avoid earning a bad name).

Factors that prevent them from saying 'NO'.

How to practice saying 'NO''.

2. Body Positivity and self-acceptance

Discuss the following with the students.

- What is body positivity and self-acceptance?
- Why is it important?
- Be kind to yourself.
- Understand that everyone's unique.

<u>Suggested Activities (Sample):</u>

(Importance of saying 'NO')

Provide worksheets to self-reflect on.....

...how they feel when others say 'no' to them

...the situations where they should say 'no'

Challenge students to write a song or rap about the importance of saying no and how to do it effectively.

Students can perform their creations for the class.

UCA 109

Sub. Code: 25UHW401

6 **Social Well-Being**

1. Practicing Gratitude

Discuss the importance of practicing gratitude for building relationships with family, friends, relatives, mentors and colleagues.

Discuss how one can show gratitude through words and deeds.

Explain how practicing gratitude can create 'ripple effect'.

2. Cultivating Kindness and Compassion

Define and differentiate between kindness and compassion.

Explore practices that cultivate these positive emotions.

Self-Compassion as the Foundation.

The power of small gestures.

Understanding another's perspective.

The fruits of compassion.

3. Practicing Forgiveness

Discuss the concept of forgiveness and its benefits.

Forgiveness: What is it? and What it isn't?

Benefits of forgiveness.

Finding forgiveness practices.

4. Celebrating Differences

Appreciate the value of individual differences and foster inclusivity.

The World: A Tapestry of Differences (cultures, backgrounds, beliefs, abilities, and appearances).

Finding strength in differences (diverse perspectives and experiences lead to better problem-solving and innovation).

Celebrating differences, not ignoring them (respecting and appreciating the unique qualities).

Activities for celebrating differences (share culture, learn about others, embrace new experiences).

UCA 110

Sub. Code: 25UHW401

5. Digital Detox

Introduce the students to:

The concept of a digital detox and its benefits for social well-being.

How to disconnect from devices more often to strengthen real-world connections.

6. Suggested Activities (sample):

(Practicing Gratitude)

Provide worksheets to choose the right ways to express gratitude. Celebrate 'gratitude day' in the college and encourage the students to honor the house keeping staff in some way to express gratitude for their service.

7. Intellectual Well-being

1. Being a lifelong Learner

Give students an understanding on:

The relevance of intellectual well-being in this 21st century to meet.

the expectations in personal and professional well-being

The Importance of enhancing problem-solving skills

Cultivating habits to enhance the intellectual well-being (using the library extensively, participating in extra-curricular activities, reading newspaper etc.)

2. Digital Literacy

Discuss:

The key aspects of digital literacy and its importance in today's world.

It is more than just liking and sharing on social media.

The four major components of digital literacy (critical thinking, communication, problem-solving, digital citizenship).

Why is digital literacy important?

Boosting one's digital skills.

3. Transfer of Learning

Connections between different subjects - How knowledge gained in one area can be applied to others.

Suggested Activities(sample):

Intellectual Well-being.

Provide worksheets to students for teaching them how to boost intellectual

well-being.

Ask the students to identify a long-standing problem in their locality, and come up with a solution and present it in the classroom. Also organize an event like 'Idea Expo' to display the designs, ideas, and suggestions, to motivate the students to improve their intellectual well-being.

8 **Environmental Well-being**

1.The Importance of initiating a change in the environment.

The session could be around:

Defining Environmental well-being (physical, chemical, biological, social, and psychosocial factors) People's behaviour, crime, pollution, political activities, infra-structure, family situation etc.

Suggesting different ways of initiating changes in the environment (taking responsibility, creating awareness, volunteering, approaching administration).

Suggested Activities (sample):

Providing worksheets to self-reflect on how the environment affects their life, and the ways to initiate a change.

Dedicate a bulletin board or wall space (or chart work) in the classroom for students to share their ideas for improving environmental well-being.

Creating a volunteers' club in the college and carrying out monthly activities like campus cleaning, awareness campaigns against noise pollution, (loud speakers in public places), addressing anti-social behaviour on the campus or in their locality.

9 **Mental Well-being**

1. Importance of self-reflection

Discuss:

Steps involved in achieving mental well-being (self-reflection, self-awareness, applying actions, achieving mental well-being).

Different ways to achieve mental well-being (finding purpose, coping with stress, moral compass, connecting for a common cause).

The role of journaling in mental well-being.

UCA 112

Sub. Code: 25UHW401

2. Mindfulness and Meditation Practices

Benefits of practicing mindful habits and meditation for overall well-being.

1. Connecting with nature

Practicing to be in the present moment - Nature walk, feeling the sun, listening to the natural sounds.

Exploring with intention - Hiking, gardening to observe the nature.

Reflecting on the emotions, and feeling kindled by nature.

2. Serving people

Identifying the needs of others.

Helping others.

Volunteering your time, skills and listening ear.

Finding joy in giving.

3. Creative Expressions

Indulging in writing poems, stories, music making/listening, creating visual arts to connect with inner selves.

Suggested Activities (Sample):

(Mindfulness and Meditation) Conducting guided meditation every day for 10 minutes and directing the students to record the changes they observe.

10 **Situational Awareness (Developing Life skills)**

1. Being street smart

Discuss:

Who are street smarts?

Why is it important to be street smart?

Characteristics of a street-smart person: Importance of acquiring life skills to become street smart (General First-aid procedure, CPR Procedure, Handling emergency situations like fire, flood etc).

2. Digital Awareness

Discuss:

Cyber Security

Information Literacy

Digital Privacy

Fraud Detection

Suggested Activities (sample):

(Street Smart) Inviting professionals to demonstrate the CPR Procedure

Conducting a quiz on Emergency Numbers.

11 **Understanding Addiction**

Plan this session around:

Identifying the environmental cues, triggers that lead to picking up this habit.

Knowing the impact of substance abuse Adverse health conditions, social isolation, ruined future, hidden financial loss and damaging the family reputation.

Seeking help to get out of this addiction.

Suggested Activities:

Provide Worksheets to check the students' level of understanding about substance addiction and their impacts.

Share case studies with students from real-life.

Play/share awareness videos on addiction/de-addiction, experts talk.

*Conduct awareness programmes on Drugs and its ill effects.

(Arrange Experts from the concerned government departments and NGOs working in drug addiction issues) and maintain the documents of the program.

Closure:

Each student should submit a Handwritten Summary of their Learnings & Action Plan for the future.

SSUCA 114

Sub. Code: 25UHW401

Assessments:

- Use Self-reflective worksheets to assess their understanding.
- Submit the worksheets to internal audit/external audit.
- Every student's activities report should be documented and the same have to be assessed by the Physical Director with the mentor. The evaluation should be for 100 marks. No examination is required.

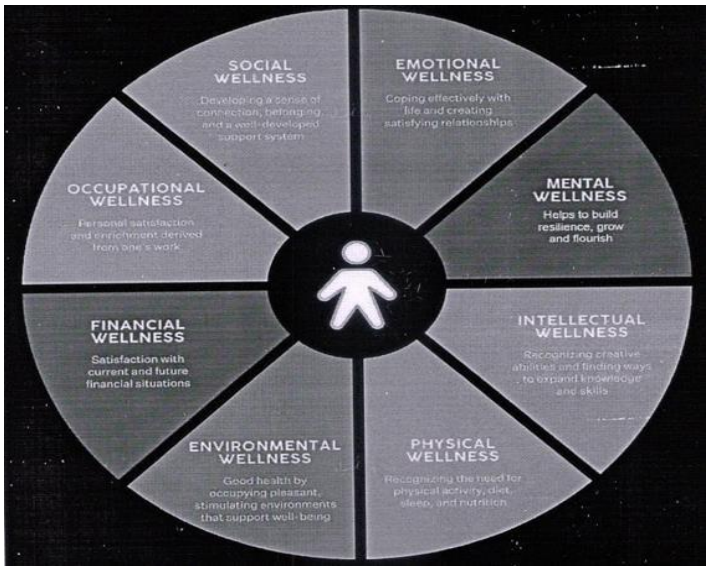
Scheme of Evaluation

Part	Description	Marks
A	Report	40
B	Attendance	20
C	Activities (Observation During Practice)	40
Total		100

References/Resource Materials:

The course acknowledges that individual needs for references and resources may vary. However, here are some general reference materials and resources that may be helpful:

1. The Well-Being Wheel:



2. **Facilities & Spaces:** Some activities may require access to specific facilities, resources or spaces. Students may need to coordinate with the college administration to reserve these as required.

3. **Online Resources:**

    1. United Nations Sustainable Development Goals - Goal 3-Good Health & Well-Being: https://www.un.org/sustainabledevelopment/health/
    2. Mindfulness and Meditation: Stanford Health Library offers mindfulness and meditation resources:

       https://healthlibrary.stanford.edu/books-resources/mindfulness-meditation.html
    3. Breaking Bad Habits: James Clear provides a guide on how to build good habits and break bad ones: https://jamesclear.com/habits
    4. 6 Ways to Keep Your Brain Sharp

       https://www.lorman.com/blog/post/how-to-keep-your-brain-sharp
    5. What Is Social Wellbeing? 12+ Activities for Social Wellness https://positivepsychology.com/social-wellbeing/
    6. How Does Your Environment Affect Your Mental Health?

       https://www.verywellmind.com/how-your-environment-affects-your-mental-health-5093687
    7. How to say no to others (and why you shouldn't feel guilty) https://www.betterup.com/blog/how-to-say-no

JOC

UCA 116

Title of the Paper : JOC -1 OPEN SOURCE DESIGNING TOOLS LAB			
Batch 2025-2028	**Hours / Week**	**Total Hours**	**Credits**
	2	30	2

Course Objectives

1. To Develop proficiency in using design tools
2. Understand the principles of design, typography, color theory, and composition to create professional quality graphics.
3. Learn to design branding materials, including business cards, banners, and social media posts, for marketing and promotional purposes.
4. To Apply photo manipulation techniques to create compelling visual compositions and enhance images for various digital and print media.
5. To create effective and aesthetically pleasing designs tailored for specific audiences, events, and brand identities.

LIST OF PRACTICAL PROGRAMS

1. Design a series of engaging social media posts for a product launch, campaign, or event.
2. Design a banner for a fictional website or online store.
3. Create a professional business card for a business or personal brand.
4. Use photo manipulation techniques to combine different images or elements into a single composition.
5. Design a t-shirt graphic for a specific target audience or event.
6. Design a restaurant menu that showcases the restaurant's offerings with an attractive layout and typography. Include sections for starters, main courses, and desserts.
7. Design a social media banner for an upcoming event. The banner should be optimized for platforms like Facebook, Instagram, and Twitter.

UCA 117

8. Design a business card that includes a QR code linking to the business's website or portfolio

9. Create a flex banner for a cultural event, including event name, date, time, venue, and an attractive visual theme.

10. Design a wedding invitation card incorporating a personalized theme with details such as couple names, wedding date, venue, and RSVP information.

11. Design a professional visiting card for a company, using a modern design aesthetic. Ensure the card includes name, designation, contact information, and company logo.

12. Design a workshop poster with details like title, speakers, venue, and time. Use appropriate imagery and colors.

UCA 118

Title of the Paper : JOC - 2 IoT Simulation Tools Lab			
Batch 2025-2028	**Hours / Week**	**Total Hours**	**Credits**
	2	30	2

Course Objectives

1. To gain knowledge on the concepts of IOT programming.
2. To design IoT applications in different domain and be able to analyze the performance
3. To know the various hardware and sensing technologies to build IoT applications.
4. Develop Practical Solutions for Automation and Monitoring
5. Build Real-World Applications with IoT Devices.

Syllabus

1. Write a Program to Blink LED (Turn an LED on and off)
2. Design a program calculate the distance using ultrasonic sensor
3. Implement the program for LED light on/ off
4. Design program for detect water drops.
5. Write a program for Smart Door Lock System
6. Design program for detect the person using fingerprint sensor.
7. Write a program to detect presence of Gas using GAS Sensor
8. Write a program to detect motion using Motion Sensor (PIR sensor)
9. Write a Program to measure Temperature and Humidity using DHT11 Sensor
10. Write a Program to count the number of buttons pushes.
11. Write a program to water overflow system.
12. Design a program for Smart Agriculture activities.

UCA 119

Title of the Paper: JOC -3 Data Visualization LAB			
Batch 2025-2028	**Hours / Week** 2	**Total Hours** 30	**Credits** 2

Course Objectives

1. To implement the concepts of different types of charts for visualization.
2. To understand the concept ofvisualization using Power BI.
3. To facilitate students to create a Power Bi Dashboard and DAX Calculations.
4. Apply basic Excel functions such as VLOOKUP for data lookup and manipulation.
5. Utilize Power BI to import data, create visualizations, add interactivity, and build interactive dashboards with DAX calculations and data modeling.

LIST OF PRACTICAL PROBLEMS

1. Create Bar charts, Line graphs, Pie charts, Scatter plots in Excel and set data legends, scales, axes, title for the above charts.
2. Create an Excel program to Perform Data Validation in Excel like Filters, Grouping, Sorting
3. Create an excel sheet to perform filter and generate statistics using pivot table in Excel.
4. Create an excel sheet to perform Excel VLOOKUP basic Operations.
5. Import the sample datasets into Power BI Desktop for visualization.
6. Create different types of charts for visualize using Power BI.
7. Demonstrate how to add interactivity to visualize through slicers, filters, and drill-through actions.
8. Create relationships between tables using Data Modeling Techniques.
9. Implement DAX Calculations and Measures using Power BI.
10. Create interactive dashboards to showcase insights of Publishing dashboards using Power BI service.
11. Perform time series analysis and create trend charts.
12. Visualize location data using map charts in Power BI.

UCA 120

Programme Code:10	Bachelor of Computer Applications			
Title of the Paper	**JOC -4 – Mobile App Development using Open Source Tools**			
Batch **2025-2028**	**Hours / Week** **2**	**Total Hours** **30**	**Credits** **3**	**Employability and Skill Development**

Course Objectives

1. To gain knowledge on the concepts of App Development.
2. To design Mobile applications in different domain and be able to analyse the performance
3. To know the various mobile hardware technologies to build the applications.
4. Perform data calculations and display user-friendly outputs.
5. Design clean, user-friendly mobile interfaces.

Course Outcomes (CO)

K3 to K5	CO1	Apply the basic concepts of mobile APP programming.
	CO2	Examine the mobile Technologies.
	CO3	Analyze Black code Programming.
	C04	Illustrate the MIT Tools.
	C05	Evaluate the ideas and concepts using Mobile App Development.

LIST OF PRACTICAL PROGRAMS

1. Design a mobile shaking app.
2. Implement a speed meter mobile app.
3. Design location sensor in app.
4. Create a countdown timer app.
5. Create location tracker mobile app.
6. Design a light Detector mobile app.
7. Develop a piano app with recording.
8. Design a age calculator app.
9. Create a maths quiz app.
10. Create an app for a Component animation.
11. Develop an animal sound Mobile app.
12. Design a Mark statement mobile app.

PGDCA

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

CURRICULUM AND SCHEME OF EXAMINATIONS
(CBCS)

(2025 – 2026 onwards)

DEPARTMENT OF COMPUTER APPLICATIONS

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

Coimbatore – 641029

DEPARTMENT OF COMPUTER APPLICATIONS

Vision

- Our vision is to offer up to date and flexible programs which will allow our graduates to be competitive in the job market.
- To achieve excellent standards of quality education by keeping pace with rapidly changing technologies.
- Integral Formation and Empowerment of students for social transformation through Computer Applications.

Mission:

- To provide outstanding education and training to our graduate students for their productive careers in industry, academia, and government.
- To impart quality and value based education to raise satisfaction level of all stakeholders.
- To empower students with academic excellence, knowledge and training.
- To enable critical thinking among students towards development in IT with reference to social transformation.
- To apply new developments in Information Management and provide all possible support to promote research & development.
- To serve as a platform whereby the student enrich their personalities to assume greater responsibilities.

PROGRAMME OUTCOME (PO)

PO1 To enhance their skills and new computing technologies through practical and theoretical knowledge of Computer.

PO2 To exhibit understanding of broad business concepts and principles.

PO3 To expertise students as computing professionals to earn more and to contribute to the economic development of the region, state and nation.

PO4 To analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.

PO5 To develop various real time applications using latest technologies and programming languages.

PO6 To pursue higher education to enhance their skill and Capable of recognizing and resolving ethical issues.

PO7 To demonstrate the capabilities required to apply cross-functional business knowledge and technologies in solving real-world business problems.

PO8 To blend analytical, logical and managerial skills with the technical aspects to resolve real world issues.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1 An ability to apply knowledge of computing and mathematics appropriate to the Discipline

PSO2 An ability to apply current techniques, skills, and tools necessary for computing practice and to integrate IT-based solutions into the user environment effectively.

PSO3 An ability to apply design and development principles in the construction of software systems of varying complexity.

PSO4 An ability to use knowledge in various domains to identify real world problems and hence to provide solution to new ideas and innovations.

PSO5 An ability to design, document and develop robust applications by considering human, financial and environmental factors using cutting edge technologies to address individual and organizational needs.

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

COIMBATORE-641029

Post Graduate Diploma in Computer Applications [PGDCA]

CURICULUM & SCHEME OF EXAMINATION

[APPLICABLE TO STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2025-2026 & ONWARDS]

Semester	Subject code	Title of the Paper	Instruction Hours / Cycle	Exam. Marks			Duration of Exam.(hours)	Credits
				CIA	ESE	Total		
I	25PDC101	Core Paper 1- Computer Networks	3	25	75	100	3	3
	25PDC102	Core Paper 2 - Relational Database Management System	3	25	75	100	3	4
	25PDC1CL	Core Practical 1 - Relational Database Management System Lab	3	40	60	100	3	4
	25PDC1CM	Core Practical 2 - Web Designing Lab	3	40	60	100	3	4
II	25PDC203	Core Paper 4 - Software Engineering	3	25	75	100	3	3
	25PDC204	Core Paper 5 - Python Programming	3	25	75	100	3	4
	25PDC2CN	Core Practical 1 - Python Programming Lab	3	40	60	100	3	4
	25PDC2CO	Core Practical 2 - Office Automation Lab	3	40	60	100	3	4
	Total					800		30

Part-wise total marks:

SUBJECT	MARKS	TOTAL CREDITS
Core Theory	**400**	**14**
Core Practical	**400**	**16**

CIA – Continuous Internal Assessment

ESE – End –of- Semester Examination

50 % CIA is applicable to all subjects for both Theory and Practical

PDC 1

SEMESTER I

SUB.CODE: 25PDC101

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper	**COMPUTER NETWORKS**		
Batch **2025-2026**	**Hours / Week** **3**	**Total Hours** **30**	**Credits** **3**

Course Objectives

- To deal with basic ideas of networking domain.
- To present the principles of Cryptography in Computer Networks.
- To know the classical, advanced encryption standards and techniques, message Authentication codes, digital signatures, email.

Course Outcomes (CO)

K1 to K5	CO1	Understanding cryptography and network security concepts and application.
	CO2	Applying securityprinciple in system design.
	CO3	Detecting network security threats.
	CO4	Understanding the various cryptographic algorithms.
	CO5	Evaluating the challenges in building networks.

Syllabus

UNIT I **(6 Hours)**

Introduction: Uses of computer networks: Business Applications-Home- Applications-Mobile Users-Social Issues. Network Hardware: LAN-MAN-WAN– Reference Models.

PDC 2

SUB.CODE: 25PDC101

UNIT II **(6 Hours)**

The Physical layer: Guided transmission media – Magnetic media-Twisted pair - Coaxial cable – Fiber Optics –Comparison of Fiber optics and Copper wire- modems- Switching.

UNIT III **(6 Hours)**

The Data link layer: Data link layer design Issues – Error Detection and Correction. Bluetooth: Blue tooth Architecture, **Bluetooth Applications ***.Data link layer switching: repeaters, hubs, bridges, switches, routers and gateways.

UNIT IV **(6 Hours)**

The Network layer: Network layer design issues – Routing algorithms: The optimality principle, shortest path routing- The Transport layer: Elements of Transport protocols.

UNIT V **(6 Hours)**

The Application layer: DNS – The Domain Name System – **Electronic mail: Architecture and services ***, Cryptography – DES – Digital Signatures: Symmetric-Key Signatures, Public-Key signatures.

* denotes self study

Text Book

1. Andrew S. Tanenbaum, "**Computer Networks"**, Sixth Edition - Pearson Education Publication, 2021.

Reference Books:

1. Behrouz A. Forouzan,(2007), **"Data Communications and Network"**, Second Edition, Tata MCGraw Hill.

2. William A Shay, (2001),**"Understanding data communications and Networks"** , Second Edition -Vikas Publication.

PDC 3

Mapping

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	H	H	S	H

S– Strong **H** – High **M** – Medium **L** – Low

PDC 4

SUB.CODE: 25PDC102

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper : RELATIONAL DATABASE MANAGEMENT SYSTEM			
Batch 2025-2026	**Hours / Week 3**	**Total Hours 30**	**Credits 4**

Course Objectives

- To develop the knowledge in various Database concepts.
- It also gives introduction to SQL language to retrieve the data from the database with suitable application development.
- To be able to construct a new normalized database.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic concepts of database management systems and database Techniques
	CO2	Understand Data constraints and CODDs rules, DML and DDL statements of ORACLE,
	CO3	Apply various DDL and DML statements, joins queries, PL / SQL statements.
	CO4	Analyze the granting and revoking permissions , cursors.
	CO5	Evaluating the challenges in building networks.

UNIT I **(6 Hours)**

Introduction: Purpose of Database Systems - View of Data - Data Models - Database Languages - Database Administrator - Database Users. Entity Relationship Model: Basic concepts –Mapping Cardinalities.

UNIT II **(6 Hours)**

Entity Relationship Diagram- E-R Features - Relational Model: Structure of Relational Databases - Relational Algebra. Interactive SQL : Invoking SQL * Plus- data definition- data manipulation in DBMS – The oracle data types.

PDC 5

SUB.CODE: 25PDC102

UNIT III **(6 Hours)**

DML and DDL statements-Data constraints- arithmetic, logical operators- oracle functions- grouping data from tables.

UNIT IV **(6 Hours)**

Manipulating dates- union, intersect and minus clause-Granting permissions-Revoking permissions- Codd's Rules- Normalization.

UNIT V **(6 Hours)**

PL/SQL: Introduction, PL/SQL syntax, understanding PL/SQL block structure, oracle transactions, cursors, stored procedures, stored functions, database triggers.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, (2006), Database System Concepts, Fifth Edition, Tata McGraw Hill Publication
2. Ivan Bayross, (2007), Commercial application development using ORACLE developer 2000, First Edition.

Reference Books:

1. Bipin.C.Desai, (2000), An Introduction to database systems, First Edition, Galgotia Publication.
2. Ivan Bay Ross, Oracle 7 The Complete Reference, First Edition, BPB Publications, Chennai.

PDC 6

SUB.CODE: 25PDC102

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	H	H	S	H

S– Strong **H** – High **M** – Medium **L** – Low

PDC 7

SUB.CODE: 25PDC1CL

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper : RELATIONAL DATABASE MANAGEMENT SYSTEM LAB			
Batch **2025-2026**	**Hours / Week** **3**	**Total Hours** **30**	**Credits** **4**

Course Objectives

1. To understand the use of Structured Query Language (SQL) and its syntax.
2. To understand and apply the principles of data modeling using entity relationship and develop a good database design.
3. To study the concepts and techniques relating query processing using SQL engines.

Course Outcomes (CO)

K1 to K5	CO1	Designing the basic concepts of database.
	CO2	Implementing data integrity constraints in database.
	CO3	Validating the various fundamental tasks to perform data modeling.
	CO4	Implementing functions, packages, stored procedures and user defined exception.
	CO5	Evaluate the trigger function to perform event.

LIST OF PRACTICAL PROGRAMS

1. Create a student mark list and do the following
   - Alter the table to add total and average fields with required size.
   - Modify to increase the total field size.
   - Calculate the total and average.
2. Create two tables in the name Employee_Personal and Employee_Salary using Primary and Foreign key concept and perform necessary operations.

PDC 8

SUB.CODE: 25PDC1CL

- Display the employee details who are all getting salary above 15000.
- Display the employee name and address who are all coming from city "Coimbatore" or "Chennai".
- Display the employee name, who are all coming from city "Coimbatore" and pincode 641029 or 641001.
- Display the employee details in descending order based on name.

3. Create a table and perform the queries using comparison, logical, set, sorting and grouping operators.
4. Write necessary queries to perform oracle built-in functions.
5. Write PL/SQL block to prepare electricity bill.
6. Write PL/SQL block:
   - ✓ Find the sum of individual number.
   - ✓ Find the given number is Armstrong number or not
7. Create a Database Triggers to check the validity of records
8. Use SQL queries to manage Views.

Guidelines to the distribution of marks for practical Examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

PDC 9

SUB.CODE: 25PDC1CL

Mapping

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

S– Strong **H** – High **M** – Medium **L** – Low

PDC 10

SUB.CODE: 25PDC2CM

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper :	**WEB DESIGNING LAB**		
Batch **2025-2026**	**Hours / Week** **3**	**Total Hours** **30**	**Credits** **4**

Course Objectives

1. To understand the basic concepts principles involved in website development.
2. To gain Basic knowledge in HTML tags and skill of creating web pages.
3. To gain knowledge about internet and it applications.

Course Outcomes (CO)

K1 to K5	CO1	Learn and Visualize the basic concept of HTML.
	CO2	Understanding and Recognize the elements of HTML.
	CO3	Analyzing the principle and basics concept of Frameset.
	CO4	Applying the principles and techniques of web page creation.
	CO5	Evaluating the functionality of Web pages using HTML.

LIST OF PRACTICAL PROGRAMS

1. Write HTML tags to display sentence with different font sizes
2. Implement the concept of Links using HTML tags.
3. Display image in web page using HTML tag.
4. Implement the types of Lists in a webpage.
5. Write HTML tags to implement Text formatting.
6. Create a static webpage using Table tags of HTML.
7. Implement the concept of Frameset in HTML.

8. Write HTML tag to display text with Marquee properties.

9. Design a new web page, which shows your Biodata.

10. Design a web page for your Department

Guidelines to the distribution of marks for practical Examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

Mapping

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

S– Strong **H** – High **M** – Medium **L** – Low

PDC 12

SEMESTER II

SUB.CODE: 25PDC203

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper :	**SOFTWARE ENGINEERING**		
Batch **2025-2026**	**Hours / Week** **3**	**Total Hours** **30**	**Credits** **3**

Course Objectives

1. To understand the basic theory of Software Engineering.
2. To describe software engineering layered technology and Process frame work.
3. To gain knowledge about qualitycontrol and how to ensure good quality software.

Course Outcomes (CO)

K1 to K5	CO1	Learning the fundamentals of software engineering concepts.
	CO2	Understanding common lifecycle processes such as waterfall model, spiral model, prototyping model, evolutionary models etc.,
	CO3	Applying the principles and techniques of software engineering in the architectural design, detail design, and implementation of software applications.
	CO4	Developing the software using different testing concepts.
	CO5	Evaluating the ability of students to perform various lifecycle activities like Analysis, Design, Implementation, Testing and Maintenance.

UNIT I **(6 Hours)**

Introduction- The Evolving role of S/W-S/W crisis-S/W Myths-S/W engineering technology-Thes/w process-S/w Process models- The Prototyping model.

PDC 13

SUB.CODE: 25PDC203

UNIT II **(6 Hours)**

Requirements engineering-System modelling- requirements analysis and elicitation for S/W-S/W prototyping- specification-mechanics of structured analysis-data dictionary- elements of analysis model- data modelling.

UNIT III **(6 Hours)**

Object oriented design-design for object oriented systems-the system design process—s/w design and s/w engineering- the design process-design principles- design concepts-effective modular design- design heuristicsfor effective modularity.

UNIT IV **(6 Hours)**

Mapping requirements into a s/w architecture- transform mapping- transaction mapping- user interface design-interface design activities-s/w testing techniques- S/W testing fundamentals-White box testing-Basis path testing- Control structure testing- Black box testing.

UNIT V **(6 Hours)**

Software testing strategies-A strategic approach to S/W testing-Validation testing-system Testing- the art of debugging- S/W quality-S/W reengineering-Reverse engineering- **Building blocks for CASE- A taxonomy of CASE tools***

*Self study

Text Book:

1. Ian Sommerville, "Software Engineering",10th Edition,2017,Pearson Publishers
2. Roger S Pressman, "Software Engineering", 5th Edition,2001,TMH Publishers.

PDC 14

SUB.CODE: 25PDC203

Reference Book

1. Watts S Humphrey,"A discipline for software engineering", Pearson EducationPublishers,2001.
2. Ian Somerville," Software Engineering",6th Edition Pearson Education publications,2001.

MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	H	S	S
CO2	S	H	S	H	M
CO3	S	H	M	H	S
CO4	S	M	S	M	H
CO5	S	S	S	H	H

S– Strong **H** – High **M** – Medium **L** – Low

PDC 15

SUB.CODE: 25PDC204

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper :	**PYTHON PROGRAMMING**		
Batch 2025-2026	**Hours / Week 3**	**Total Hours 30**	**Credits 4**

Course Objectives

1. To understand the fundamentals of Python Programming.
2. To get knowledge about the Functions in Python.
3. To understand the concepts of List and String methods.

Course Outcomes(CO)

K1 – K5	**CO1**	To implement basic concepts of operators and functions.
	CO2	To Review various string, list, tuple and dictionaries.
	CO3	To evaluate the functionality of an exception handling.
	CO4	To analyze the concept of classes and objects.

Unit I **(6 Hours)**

Introduction – Python Overview - Statements – Comments – Identifiers – Keywords- Data types.

Unit II **(6 Hours)**

Python Program Flow: Indentation - Simple Input & Output – Simple Output Formatting – Operators in Python –Control Statements - Looping Statement.

PDC 16

SUB.CODE: 25PDC204

Unit III **(6 Hours)**

Functions: Built-in- Functions – User Defined Functions – Parameters and Arguments – Function Calls

Unit IV **(6 Hours)**

Strings and Lists

Unit V **(6 Hours)**

Tuples and Dictionary

Text book:

1. E.Balagurusamy(2017)m,Problem Solving and Python Programming by, McGraw-Hill first edition .

Reference books:

1. AshokNamdev Kamthane,,Amit Ashok Kamthane(2017),Programming and Problem Solving with Python.
2. John B. Schneider Shira Lynn Broschat Jess Dahmen.(2019), Algorithmic Problem Solving with Python.

Mapping

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

S–Strong **H**–High **M**–Medium **L**–Low

PDC 17

SUB.CODE: 25PDC2CN

Programme code : 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the paper :	**PYTHON PROGRAMMING LAB**		
Batch **2025-2026**	**Hours / Week** **3**	**Total Hours** **30**	**Credits** **4**

Course Objectives

1. To gain knowledge about the fundamentals of python programming.
2. To understand the concepts of string, list, tuple.
3. To implement the concept of exception handling, classes and objects.

Course Outcomes(CO)

K3	CO1	To implement basic operators and function concepts.
K4	CO2	To Review various string and list methods.
K5	CO3	To execute exception handling.

LIST OF PRACTICAL PROGRAM

1. Write a python program to check prime number.
2. Write a python program to display Fibonacci series using recursion.
3. Write a Python Program to Convert Decimal to Binary, Octal and Hexadecimal.
4. Write a Python Program to demonstrate String Operations.
5. Write a Python Program to Check Whether a String is Palindrome or Not
6. Write a Python function that accepts a string and counts the number of Upper case and Lowercase letters.
7. Write a Python function to calculate the Factorial of a number
8. Write a Python function to sum all the numbers in a list.
9. Python Program to Check if a Key is Already Present in a Dictionary
10. Write a Python Program to demonstrate Working with Tuples.

PDC 18

SUB.CODE: 25PDC2CN

Guidelines to the distribution of marks for practical examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	**Program1 (Marks)**	**Program2 (Marks)**
Algorithm	10	10
Design	10	10
Result	5	5

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	M	M	M	M
CO2	M	M	H	H	H
CO3	H	H	S	S	S

S–Strong **H**–High **M**–Medium **L**–Low

PDA 19

SUB.CODE: 25PDC2CO

Programme Code: 10	**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**		
Title of the Paper	**OFFICE AUTOMATION LAB**		
Batch	**Hours / Week**	**Total Hours**	**Credits**
2025-2026	**3**	**30**	**4**

Course Objectives

1. To understand the basic concepts of MS-Word.
2. To develop database using MS-Access.
3. To understand the concepts in MS-Excel.

Course Outcomes (CO)

K1 to K5	CO1	Learning the formatting skills on paragraphs, tables and lists.
	CO2	Generating various visualization representations
	CO3	Understanding and remember various menus in office automation
	CO4	Applying the database components to develop table using MS-Access
	CO5	Implementing the basics of MS -Excel

LIST OF PRACTICAL PROBLEMS

1. Create a mail merge using MS-word
2. Prepare Resume using Ms-word.
3. Create a front page for Newspaper using MS-Word.
4. Prepare Student mark sheet using MS-Excel.
5. Payroll calculation using MS-Excel.

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6. Create a Bar Chart in excel for Result Analysis
7. Create database for stock maintenance and generate report.
8. Create a table in MS-Access.

Guidelines to the distribution of marks for practical Examinations:

- Two questions will be given for each student (3 Hours / 60 Marks)
- Record Work - 10 Marks
- Algorithm, Program, Typing and Execution : 50 Marks.

Particulars	**Program I (Marks)**	**Program II (Marks)**
Algorithm	10	10
Program Writing	10	10
Typing and Execution	5	5

Mapping

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

S– Strong **H** – High **M** – Medium **L** – Low