KONGUNADU ARTS AND SCIENCE COLLEGE(AUTONOMOUS)

COIMBATORE – 641 029

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2023 – 2024)

DEPARTMENT OF COMPUTER APPLICATIONS (UG)

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
Coimbatore – 641029

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.

- Moulding the teachers in such a way that they become the role models in promoting Higher Education.

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 contributeto 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 – 641 029

Course Name: Bachelor of Computer Applications [BCA]

Curriculum and Scheme of Examination under CBCS

(Applicable to the students admitted during the Academic Year 2021-2022)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
					CIA	ESE	TOTAL		
I	I	21TML1A1	Language I@	6	50	50	100	3	3
	II	21ENG101	English -I	6	50	50	100	3	3
	III	21UCA101	Core Paper 1 - C Programming	5	50	50	100	3	4
	III	21UCA1CL	Core Practical 1 - C Programming Lab	5	50	50	100	3	2
	III	21UCA1A1	Allied Paper 1 - Business Accounting	6	50	50	100	3	5
	IV	21EVS101	Environmental Studies **	2	-	50	50	3	2
			Total	**30**	-	-	**550**	-	**19**
II	I	21TML2A2	Language II@	6	50	50	100	3	3
	II	21ENG202	English –II	6	50	50	100	3	3
	III	21UCA202	Core Paper 2 -- Object Oriented Programming with C++	4	50	50	100	3	4
	III	21UCA203	Core Paper 3 - Digital Fundamentals and Computer Organization	3	50	50	100	3	4
		21UCA2CM	Core Practical 2 – Object Oriented Programming with C++ - Lab	3	50	50	100	3	2
	III	21UCA2A2	Allied Paper 2 - Computer Oriented Numerical and Statistical methods	6	50	50	100	3	5
	IV	21VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
			Total	**30**	-	-	**650**	-	**23**
III	III	21UCA304	Core Paper 4 – Operating Systems	5	50	50	100	3	4
	III	21UCA305	Core Paper 5 – Data Structures and Algorithms	5	50	50	100	3	4
	III	21UCA306	Core Paper 6– Relational Database Management Systems	5	50	50	100	3	4
	III	21UCA3CN	Core Practical 3 - Relational Database Management Systems Lab	5	50	50	100	3	2
	III	21UCA3A3	Allied Paper 3 - Operations Research.	6	50	50	100	3	5
	IV	21UCA3S1	Skill Based Subject 1- Python Programming	2	50	50	100	3	3
	IV	21TBT301/21TAT301/21UHR3N1	Basic Tamil* / Advanced Tamil**/ Non-major elective- I**	2	-	75	75	3	2
			Total	**30**	-	**-**	**675**	-	**24**
IV	III	21UCA407	Core Paper 7 – Software Engineering	5	50	50	100	3	4
	III	21UCA408	Core Paper 8 – Computer Networks	5	50	50	100	3	4
	III	21UCA409	Core Paper 9: –Advanced Java Programming	5	50	50	100	3	5
	III	21UCA4CO	Core Practical 4 – Advanced Java Programming Lab	5	50	50	100	3	2
	III	21UCA4A4	Allied Paper 4 - Organizational Behavior and Marketing	6	50	50	100	3	5
	IV	21UCA4S2	Skill Based subject 2- Python Programming Lab	2	50	50	100	3	3
	IV	21TBT402/21TAT402/21UWR4N2	Basic Tamil* / Advanced Tamil**/ Non-major elective- II**	2	-	75	75	3	2
			Total	**30**	-	-	**675**	-	**25**
V	III	21UCA510	Core Paper 10 - Visual Programming	6	50	50	100	3	5
	III	21UCA511	Core Paper 11 - Artificial Intelligence and Expert Systems	6	50	50	100	3	5
	III	21UCA512	Core Paper 12 - Data Mining and Warehousing	5	50	50	100	3	5
	III	21UCA5CP	Core Practical 5 – Visual Programming Lab	5	50	50	100	3	2

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	Part	Code	Title		CIA	ESE	Total	Hrs	Credits
	III	21UCA5E1	Major Elective 1	6	50	50	100	3	5
	IV	-	**EDC**	2	**50**	**50**	100	3	3
	-	**21UCA5IT**	**Internship Training ******				Grade		
			Total	30	-	-	**600**	-	**25**
VI	III	21UCA613	Core Paper 13 - Web Designing	6	50	50	100	3	4
	III	21UCA614	Core Paper 14 – Information Security	6	50	50	100	3	5
	III	21UCA6CQ	Core Practical 6 - Web designing Lab	6	50	50	100	3	2
	III	21UCA6E2	Major Elective 2	5	50	50	100	3	5
	III	21UCA6Z1	Project***	3 $$	**50**	**50**	100	-	4
	IV	21UCA6SL	Skill Based Subject 3 - Linux Programming Lab	2	25	25	50 @@	3	1
	IV	21UCA6NM	Project Based Learning: Advanced Platform Technology / Data Analytics & Visualization http://kb.naanmudhalvan.in/images/3/3d/IBM_PBL.pdf	2	25	25	50		2
			Total	30	-	-	**600**	-	**23**
	V	21NCC/NSS/YRC/PYE/ECC/RRC/WEC101#	Extension Activities*	-	50	-	50	-	1
			Grand Total	-	-	-	**3800**	-	**140**

Note :

CBCS – Choice Based Credit system

CIA – Continuous Internal Assessment

ESE – End of Semester Examinations

@ Hindi/Malayalam/ French/ Sanskrit – 21HIN/MLM/FRN/SAN101 - 404

@@ End semester examination will be conducted for 50 marks and the marks will be converted to 25 marks.

Naan Mudhalvan Course: End of semester will be assessed by Industry for 25 marks and CIA will be done by

the course teacher

The course can be opted to suit the skill set requirement of the core domain from the courses provided by the Bharathiar University and the same may be intimated to the COE during the beginning of that particular semester.

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

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

*** Project Report – 35 marks; Viva voce – 15 marks; Internal-50 marks

$$ - 3 hours allocated for project would not be allocated for staff workload.

**** The students shall undergo an Internship training / field work for a minimum period of 2 weeks at the end of the fourth semester during summer vacation and submit the report in the fifth semester. The report will be evaluated for 100 marks along with the internal viva voce by the respective Faculty. 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. Internet of Things
2. Open Source Systems
3. Android Applications and Development
4. Client /Server Techniques
5. Virtual Reality
6. Cloud Computing and Azure

Non-Major Elective Papers

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

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

21UCA5XL - Internet and Office Automation

List of Extension 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)

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.

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil/Hindi/Malayalam/ French/ Sanskrit	200	6
2.	II	English	200	6
3.	III	Core – Theory/Practical	2000	72
	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	Extension Activities	50	1
		Total	**3800**	**140**

➤ 50 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra credit courses.

➤ The students to complete any **MOOC On learning platforms like SWAYAM, NPTEL, Course era, IIT Bombay Spoken Tutorial etc.,** 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.

➤ A **Field Trip** preferably relevant to the course should be undertaken every year.

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Components of Continuous Internal Assessment (50 Marks)

Components		Marks	Total
Theory			
CIA I	75	(75+75) converted to 30	
CIA II	75		
Problem based Assignment**		10	50
Attendance		5	
Others*		5	
Practical			
CIA Practical		(50) converted to 30	
Observation Notebook		15	50
Attendance		5	
Project			
Review		45	50
Regularity		5	

*Class Participation, Case Studies Presentation, Field Work, Field Survey, Group Discussion, Term Paper, Workshop/Conference Participation. Presentation of Papers in Conferences, Quiz, Report/Content writing. Etc.
** Two Assignments to be given. (Each 5 marks).

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

Theory Examination – Part I, II & III

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	
K1 – K5 Q11 to 15	B (Either or type)	5 x 5= 25	Short Answers	75**
K2 – K5 Q16 to 20	C (Either or type)	5 x 8 = 40	Descriptive / Detailed	

For ESE 75 marks converted to 50 marks.

ESE Practical Examination:

Knowledge Level	Section	Marks	Total
K3	Experiments	40	50
K4	Record Work	10	
K5			

Knowledge Level	Section	Marks	Total
K3	Experiments	20	25
K4	Record Work	05	
K5			

ESE Project Viva Voce:

Knowledge Level	Section	Marks	Total
K3	Project Report	30	50
K4	Viva voce	20	
K5			

Sub.Code:21UCA510

Programme code : 10	Bachelor of Computer Applications		
Title of the paper	Core Paper 10 - Visual Programming		
Batch	Hours / Week	Total Hours	Credits
2021 – 2022	6	90	5

Course Objectives

1. To gain the practical aspects for developing Graphical User Interface.

2. To provide a consistent object-oriented programming environment.

3. To provide application development using .Net framework.

Course Outcomes (CO)

	CO1	Learning the concepts of Visual Basic and .Net
K1 to K4	CO2	Summarizing the advantages of Controls in VB
	CO3	Demonstrating the concepts of .NET Framework
	CO4	Designing and developing the distributed data driven applications and C# console applications.

Syllabus

UNIT I   (18 Hours)

Introduction to Visual Basic - Steps in VB Application - Integrated development environment (IDE)- Variables - Scope of variables- constants - Data types - Functions - Procedures - Control Structure - Arrays -Control Arrays- User defined Data types - operators - String, **Date and Time functions-** Creating and using Standard Controls - Text Box – Command Button - Check Box - Combo Box - List Box - Option Button - Timer Control - Frame, Label, Shape & Line controls - Picture Box - Image Controls - **Scroll Bars *** - Data Controls

UNIT II   (18 Hours)

Menus - Menu Editor - Menu Creation - Modifying and Deleting Menu Items - Adding a menu Separator - Creating Submenus. - Data Access Objects (DAO). Data Report - Data Environment Designer - Connection Object - Command Object - Section of the Data Report Designer - Data Report Controls - Creating a Simple Data Report.

UNIT III (VB.NET)   (17 Hours)

.Net Frame work and the CLR –IDE- Procedures, Scope and Exception Handling- Adding Controls – Handling Events – Creating MDI applications-Database connectivity.

UNIT IV (ASP.NET)   **(19 Hours)**

What are Active Server pages– ASP Objects – ADO and ADO.NET Objects- ASP
Components.

UNIT V (C SHARP)   **(18 Hours)**

Introduction- Exception, Exception in method –Exception throw- String – Struct- Class
definition – Class instance – Object reference – Operator Overload.

* denotes Self Study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text books:

1. Content Development Group,(2004),"Visual Basic 6 Programming",
First Edition ,TataMCGrawHill Publication,. (Unit-I,II)

2.Steven Holzner, (2002), "Visual Basic.NET Black Book Dream Tech", First Edition.(Unit
III)

3.Dave Mercer, (2002), ASP.Net,A Beginner's Guide", TataMCGraw Hill, (Unit IV)

4.E.Balagurusamy, "Programming in C#", Second Edition ,TataMCGraw Hill Publication ,.
(Unit V)

Reference book:

1. Scott Warner,(2000),"**Teach Yourself Visual Basic 6**", Tata McGraw-Hill
Edition,First Edition.

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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

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

Programme code : 10	Bachelor of computer applications		
Title of the paper	Core Paper 11 - Artificial Intelligence And Expert Systems		
Batch	Hours / Week	Total Hours	Credits
2021-2022	6	90	5

Course Objectives

1. To learn the concepts of Artificial Intelligence.
2. Create awareness of informed search and exploration methods.
3. To demonstrate AI techniques for knowledge representation, planning and uncertainty Management.

Course Outcomes (CO)

	CO1	Understand the concept of AI
K1 to K4	CO2	Analyze and evaluate informed search and exploration methods.
	CO3	Apply AI techniques for knowledge representation, planning and uncertainty Management.
	CO4	Analyze and develop knowledge of decision making and learning methods for real time application

Syllabus

UNIT I: (18 Hours)

INTELLIGENT AGENTS AND SEARCHING METHODS

Definitions of AI - Intelligent Agents**:** Agents and environments - Good behavior – The nature of environments – structure of agents. Informed search and exploration**:** Informed search strategies – heuristic functions – local search algorithms.

UNIT II (18 Hours)

LOGIC

Logical agents: Knowledge-based agents – The Wumpus world. Logic – Propositional logic: A very simple logic. First order logic: Representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic. Inference in First order logic: propositional versus first order logic –forward chaining – backward chaining.

UNIT III   **(18 Hours)**

PLANNING AND UNCERTAINTY

Planning: The planning problem- planning with state-space search-partial order planning –graphs. Uncertainty: Overview of probability concepts, Representing knowledge in an Uncertain Domain, Semantics of Bayesian Networks, Exact Inference in Bayesian Networks

UNIT IV   **(18 Hours)**

DECISION MAKING AND LEARNING

Making Simple Decisions: The basis of Utility theory – Utility and multi-attribute utility functions – decision networks – The value of information – Decision theoretic expert systems**.** Learning from Observations: Forms of learning - Inductive learning - Learning decision trees. Knowledge in Learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming.

UNIT V   **(18 Hours)**

LEARNING AND COMMUNICATION

Statistical Learning Methods: Introduction to neural networks, Perceptron's, Multi-layer feed forward network, Application of ANN.Reinforcement Learning: Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning. Communication: Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation.

Text Book :
   1. Stuart Russell, Peter Norvig,(2009) "Artificial Intelligence – A Modern Approach", Third Edition, Pearson Education / Prentice Hall of India.

References:
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 Problem Solving", Pearson Education / PHI.

MAPPING

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

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

UCA 12

Programme Code:10	Bachelor of Computer Applications		
Title of the paper	Core Paper 12 - Data Mining And Warehousing		
Batch	Hours / Week	Total Hours	Credits
2021-2022	5	75	5

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.

Course Outcomes (CO)

K1 to K4	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.

Syllabus

UNIT 1   **(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   **(14 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   **(16 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 delhi, (Unit-IV)
2. Pieter Adriaans, Dolf Zantinge,(2001), **"Data Mining ",** Addison Wesley,(Unit I,II,III &V)

Reference Book
1. Margaret H.Dunham,(2003),"Data Mining – Introductory and Advanced Topics", Pearson Education.

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MAPPING

PSO / CO	PSO1	PSO 2	PSO 3	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

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

UCA 15

Programme code : 10	Bachelor of computer applications		
Title of the paper	Core Practical 5- Visual Programming Lab		
Batch	Hours / Week	Total Hours	Credits
2021-2022	5	75	2

Course Objectives

1. To gain the practical aspects of application development using fundamentals of ASP. Net and C#.
2. To know the concepts of web server controls, form validation, tracking and session handling.
3. To develop programs using error handling, inheritance, delegates, file operations and ADO.net Connectivity.

Course Outcomes (CO)

K1 to K4	CO1	Understanding and implementing the concepts of Visual Basic.
	CO2	Applying the behavior of various objects and classes in . Net.
	CO3	Implementing the concepts of decision and iteration using control structures.
	CO4	Designing and developing the applications using. Net Technologies

LIST OF PRACTICAL PROGRAMS

1. Develop a program to perform Navigation of list of items between two list boxes.

2. Design an application using the Common Dialog Control to display the font family.

3. Develop a simple project to calculate Electricity Bill using DAO method and print it in a neat Report format.

4. Develop a simple project to search a record & update it newly using DAO method for student information (Calculating Attendance and Mark list).

5. Develop a Simple Project, showing the process (using payroll process)
      1) Move first   2) Move Last   3) Move Previous   4) Move Next.

6. Develop a Program to simulate a simple calculator using VB.Net.

7. Develop a Program to simulate a digital clock with reset option using VB.Net

8. Develop a Program to maintain Employee details using VB.Net.

9. Develop a program to Print one sentence for many times with different font sizes using ASP.NET.

10. Using arrays develop a program to Search a Name from a given list.

11. Develop a C# program to Calculate Student mark list using Loop.

12. Develop a Program to manipulate String Objects using Array Sort() &
Array Reverse ().

<u>Guidelines to the distribution of marks for practical Examinations:</u>

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

Internal Mark Split-ups for 40 Marks: Observation- 10 Marks, Attendance- 5 Marks,

Two Model Practical-25 Marks.

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

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

Sub.Code: 21UCA613

Programme Code:10	Bachelor of Computer Applications		
Title Of The Paper:	Core Paper 13 - Web Designing		
Batch	Hours / Week	Total Hours	Credits
2021-2022	6	90	4

Course Objectives

1. To understand website development in a user friendly manner.

2. To improve the visual design and content structuring.

3. To understand the concept of Bootstrap to develop their web development skill.

Course Outcomes (CO)

	CO1	Understanding the use of HTML tags.
K1 to K4	CO2	Learning and using Cascading Style Sheet..
	CO3	Understanding the concept of JavaScript.
	CO4	Designing and Developing web pages using HTML,CSS,JavaScript and BootStrap

Syllabus

UNIT I   **(14 Hours)**

HTML:-Introduction- Core Elements and Attribute – Basic Text Formatting-Presentational Elements-Phrase Elements- Lists- Editing Text- Using Character Entities for Special Characters-Comments-Font Elements- Basic Links-Creating Links with the <a> Element-Adding Images to Website- Using Images as Links- Tables-Forms-Frames.

UNIT II   **(15 Hours)**

Cascading Style Sheets: Introducing CSS-CSS Rules, Properties, Types of CSS –Controlling Fonts-Text Formatting-Selectors: Type, Class, ID, and Attribute Selectors. Lengths-Percentages, Introducing the Box Model. Links- Backgrounds-Positioning with CSS-Page Layout   .

UNIT III   **(15 Hours)**

Java Script: Learning JavaScript-How to add a script to your pages-The Document Object Model-Starting to Program with JavaScript- Variables-Operators-Conditional Statements-Looping. Java Script Arrays: Passing Arrays to Functions-Multiple Subscripted Arrays.

Java Script Functions: Functions- Function Definition - Duration Of Identifiers – **Scope Rules*** – Recursion – Java Script Global Functions. Events-Built-In Objects-Writing JavaScript. Working with JavaScript: Form Validation-Image Rollovers.

UNIT IV (15 Hours)

Bootstrap: What is Bootstrap? Bootstrap History-Why to use Bootstrap?- Where to get Bootstrap?- Bootstrap Grid System: Basic structure of a Bootstrap Grid- Bootstrap Tables-Bootstrap Images – Bootstrap Buttons- Bootstrap Buttons Groups.

UNIT V (16 Hours)

Bootstrap List Groups- Bootstrap Form Layouts – Form inputs- Input sizing- Bootstrap dropdowns- Bootstrap collapse- Bootstrap Panels-Tooltip –Tabs and Pills- Scrollspy- **Bootstrap carousel plug-in*.**

*denotes Self Study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

TEXT BOOKS

1. Jon Duckett (2000) – "Beginning Web Programming With HTML, XHTML AND CSS", –
Second Edition, Wiley India Pvt Ltd (Unit-I, II, III)
2. Bootstrap 4 Quick Start: A Beginner's Guide to Building Responsive Layouts with Bootstrap
 (Unit-IV,V)

REFERENCE BOOKS

  1. Thomas A. Powell, "The Complete Reference HTML", – Second Edition Tata McGraw Hill Publication.

  2.Chris Bates - "Web Programming Building Internet Applications", Second Edition, John Wiley & Sons, Ltd.

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

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

Programme Code : 10	Bachelor of Computer Applications
Title of the Paper : Core Paper 14 – Information Security	

Batch 2021 - 2022	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To understand all aspects of cyber security including network security, computer security and information security.

2. To become information security professionals for the high-end jobs insecurity.

Course Outcomes (CO)

	CO1	Recollect the basic security concepts of the digital computer system.
K1 to K5	CO2	Understand the malicious codes and virus attachments of a file.
	CO3	Apply the security mechanisms, firewalls and intrusion detection systems in the computer field.
	CO4	Analyze different types of security flaws , Legal and Ethical issues in computer security.
	CO5	Evaluate the usage of Legal and Ethical Issues in Computer Security.

Syllabus

UNIT I 18 Hours

Is there Security Problem in Computing? : What does Security mean? – Attacks -The Meaning of Computer Security-Computer Criminals. Protection in general purpose operating systems : File Protection Mechanisms-User Authentication.

UNIT II 18 Hours

Program Security: Non malicious Program Errors – Viruses and other Malicious Code: Kinds of Malicious Code, How Viruses Attach, Home for Viruses, The Source of Viruses, Prevention of Virus Infection, Truths and Misconceptions About Viruses. Targeted Malicious Code: Trapdoors, Salami Attacks - Controls against Program Threats: **Developmental controls*.**

UNIT III   **18 Hours**

Database and Data Mining Security: Introduction to Databases- Security Requirements - Reliability and Integrity - Multilevel Databases – **Data Mining*.**

UNIT IV   **18 Hours**

Security in Networks: Network Concepts-Threats in Networks: Who attacks networks? Reconnaissance, Threats in transit: Eavesdropping and wiretapping, Microwave - Summary of wiretapping-Intrusion Detection Systems.

UNIT V   **18 Hours**

Legal and Ethical Issues in Computer Security: Protecting Programs and Data - Information and the Law - Computer Crime: Why computer crime is hard to prosecute - Ethical Issues in Computer Security.

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

TEACHING METHODS

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

TEXT BOOK

1. Charles P.Pfleeger, Shari Lawrence Pfleeger, Deven N.Shan, (2007), **Security in Computing**, Fourth Edition, Prentice Hall Publication.

REFERENCE BOOKS

1. Ross J. Anderson, Ross Anderson, (2001), **Security Engineering: A Guide to Building Dependable Distributed Systems**, Wiley Publication.
2. Debby Russell, Sr. G. T. Gangemi, (2006), **Computer Security Basics** (Paperback),Second Edition, O'Reilly Media Publication.
3. Thomas R. Peltier, Justin Peltier, John Blackley, (2010), **Information Security Fundamentals**, Second Edition, Prentice Hall Publication.

UCA 21

MAPPING

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

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

Programme Code:10	Bachelor of Computer Applications		
Title of the paper	Core Practical 6 - Web Designing Lab		
Batch

2021 - 2022 | Hours / Week

6 | Total Hours

90 | Credits

2 |

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 facilitate students to create a website using HTML and Bootstrap

Course Outcomes (CO)

	CO1	Understanding the use of HTML tags.
K2 to K4	CO2	Learning and using Cascading Style Sheet..
	CO3	Understanding the concept of JavaScript.
	CO4	Designing and developing 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. Design a web page for Computing Student Mark Llist using JavaScript.

5. Design a web page for an Advertising using StyleSheets.

6. Design a web page with the following components using JavaScript.

   a) Image b) Hyperlink c) Scroll Bar d) Animation.

7. Design a web page for Library system using HTML Tags.

8. Design a web page for Payroll Processing using Java Script.

9. Design a web page for Electricity Bill Preparation using JavaScript.

10. 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	10	10
Program Writing	10	10
Typing and Execution	5	5

Internal Mark Split-ups for 40 Marks: Observation- 10 Marks, Attendance- 5 Marks,

Two Model Practical-25 Marks.

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	H	M	H	H	H

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

Project Work and Viva-voce

Sub.Code: 21UCA6Z1

Programme Code:10	Bachelor of Computer Applications		
Core Project – Project Work & Viva – Voce			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**3**	**45**	**4**

Course Objectives

1. To acquire the knowledge about selecting the task based on their course skills.

2. To get the knowledge about analytical skill for solving the selected task.

3. To get confidence by implementing the task in a real time projects.

Course Outcomes (CO)

K3 to K5	CO1	Applying programming skill for solving the project.
	CO2	Analyzing the task and to collect the necessary information and software.
	CO3	Evaluating and Testing the task based on the software.
	CO4	Implementing the software for getting the Report.

Guidelines to the Distribution of Marks:

CIA	Project Review	15	**20**
	Regularity	5	
ESE	Project Report Present	60	**80**
	Viva – Voce	20	
Grand Total			**100**

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

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

UCA 26

Programme code : 10	Bachelor of Computer Applications		
Title of the paper	Skill Based Subject 3 - Linux Programming Lab		
Batch 2021-2022	Hours / Week 2	Total Hours 30	Credits 1

Course Objectives

1. To gain knowledge about the usage of shell scripting.

2. To teach the concepts of using arithmetic operations and looping.

3. To impart knowledge about the creation of files and directories.

Course Outcomes (CO)

K3 to K5	CO1	Applying the concepts of control structures in programming.
	CO2	Implementing the concepts of file operations in programming
	CO3	Analyzing the concept of dialog utilities in shell programming.

LIST OF PRACTICAL PROGRAMS

1. Write a shell program to display your address.

2. To perform arithmetic operations using shell arithmetic.

3. Print the different patterns using looping operations.

4. To perform simple inventory control operation using read statement.

5. To prepare the student mark statement using necessary controls.

6. Sort the given numbers in both ascending and descending orders.

7. Write a shell program to perform user defined function concept.

8. Write a shell program using dialog utility concept.

9. Write a program to perform file operation.

10. Write a shell script to print 'Hello Linux' message in Bold, Blink and different colors.

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

Internal Mark Splitup for 40 Marks: Observation- 10 Marks, Attendance- 5 Marks, Two Model Practical-25 Marks.

Teaching Methods:

Smart Classroom, Projector, Discussion

Mapping

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

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

Sub.Code: 21UCA5XL

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Extra Departmental Course – Internet and Office Automation -LAB		
Batch 2021-2022	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To gain knowledge about the concepts of Internet

2. To understand the concepts of MS-Word, MS-Excel

3. To develop database using MS-Access and presentation using MS-PowerPoint

K1 to K5	CO1	Understanding and remember various menus in office automation
	CO2	Implementing the concepts of Internet techniques
	CO3	Applying the database components to develop table using MS-Access

LIST OF PRACTICAL LIST

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 mark sheet using MS-Excel.

8. Create a slide show 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 (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

Internal Mark Splitup for 40 Marks: Observation- 10 Marks, Attendance- 5 Marks,

Two Model Practical-25 Marks.

Teaching Methods:

Smart Classroom, Projector, Discussion

Mapping

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

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

Electives for Fifth and Sixth Semester

Programme code: 10	Bachelor of Computer Applications		
Title of the Paper	Internet Of Things		
Batch	Hours/Week	Total Hours	Credits
2021-2022	6	90	5

Course Objectives

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

Course Outcomes (CO)

K1 to K4	CO1	Analyzing and evaluate the data received through sensors in IOT.
	CO2	Design and develop smart city in IoT
	CO3	Analyze various protocols for IoT.
	CO4	Analyze applications of IoT in real time scenario

Syllabus

UNIT I (15 Hours)

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

UNIT II (15 Hours)

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

UNIT III (15 Hours)

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

UNIT IV: (15 Hours)

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

UNIT V: (15 Hours)

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

* denotes Self Study

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Book

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 of Things – Key applications and Protocols‖, Wiley.

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

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

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

Programme Code:10	Bachelor of Computer Applications		
Title of the paper	**Open Source Systems**		

Batch	Hours / Week	Total Hours	Credits
2021-2022	**5**	**75**	**5**

Course Objectives

1.To recognize the benefits and features of Open Source Technology.

2.To utilize open source software for developing a variety of software applications, particularly Web applications.

3.To understand concepts, strategies, and methodologies related to open source software development.

Course Outcomes (CO)

K1 to K4	CO1	To understand the use of various open source software available in the industry.
	CO2	To summarize the basic concepts of how a database stores information via tables.
	CO3	To learn how to use lists, tuples, and dictionaries in Python programs.
	CO4	To understand the appropriate applications of the Perl language.

Syllabus

UNIT 1   (9 Hours)

Introduction

Introduction to Open Sources – Need of Open Sources – Advantages of Open Sources– *Application of Open Sources - Open Source Operating Systems: LINUX: Introduction – General Overview – Kernel Mode and User Mode- Development with Linux.

UNIT II   (9 Hours)

MySQL

Introduction – Setting up Account –Record Selection Technology – Working with Strings – Date and Time– Sorting Query Results – Generating Summary – Working with Metadata – Using Sequences.

UNIT III   (9 Hours)

PHP

Introduction – Programming in Web Environment – Variables – Constants –Data; Types – Operators – Statements – Functions – Arrays – OOP – String Manipulation and Regular Expression – File Handling and Data Storage – PHP and SQL Database – PHP and LDAP – PHP Connectivity – Sending and Receiving E-mails.

UNIT IV   **(9 Hours)**

Python

Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples –

Dictionaries* – Conditionals and Loops – Files – Input and Output – Errors and Exceptions –

Functions – Modules – Classes and OOP – Execution Environment.

UNIT V   **(9 Hours)**

PERL

Perl Backgrounder – Perl Overview – Perl Parsing Rules – Variables and Data – Statements and

Control Structures – Subroutines - Packages and Modules - Working with Files – Data

Manipulation.

*denotes Self Study

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz / Discussion

TEXT BOOKS

1. Remy Card, Eric Dumas and Frank Mevel (2003), "The Linux Kernel Book", Wiley Publications.
2. Steve Suchring(2002), "MySQL Bible", John Wiley.
3. Wesley J. Chun (2001), "Core Phython Programming", Prentice Hall.
4. Martin C. Brown (2009), "Perl: The Complete Reference", Second edition, Tata McGraw-Hill, Indian Reprint.
5. Steven Holzner (2009) "PHP: The Complete Reference", Second edition, Tata McGraw-Hill, Indian Reprint.

REFERENCE BOOK

1. Vikram Vaswani (2009), "MYSQL: The Complete Reference", Second edition, Tata McGraw-Hill, Indian Reprint.
2. Rasmus Lerdorf and Levin Tatroe(2002), "Programming PHP", O'Reilly.

MAPPING

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

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Android Applications and Development**		
Batch 2021-2022	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To learn the basics of Android and understand the application lifecycle.

2. To learn the power of background services, threads, and notifications.

3. To introduce the principles of inheritance, packages, interfaces files and basics of Swings and Android.

Course Outcomes (CO)

	CO1	Learning the working process ofAndroid applications
K1 to K4	CO2	Developing Andriod tools for creating Icons
	CO3	Applying UI-rich apps using all the major UI components
	CO4	Implementing Animation Concepts and Techniques using XML and Android content providers for frame applications

Syllabus

UNIT I   (14 Hours)

The History of the Android OS-Configuring Your Android App Development System-Updating Eclipse ADT- Configuring Eclipse Android SDK Manager Repository- Android Virtual Devices- Creating the AVD.

UNIT II   (15 Hours)

Android Application Development Platform: How the Android Platform is Structured – Android Runtimes - Creating Your First Android Application - **Android Resources***- Asset Project

Folders-Creating a Custom App Launch Icon: Creating a Launch Icon for Each Screen Density- Creating Transparency-Creating Resolution Density App Launch Icons.

UNIT III   **(16 Hours)**

Introduction to XML: Defining an Android App, Its Design, and Constants-Android Screen Design: Writing to the Display Using Activity and View- Making Apps Interactive: Intents, Event Handling, and Menus.

UNIT IV   **(15 Hours)**

Android Animation: Making Your UI Designs Move-Frame Animation Concepts and Techniques-Creating Frame Animation Using XML Markup-Creating Frame Animation in Main Activity-Creating Tween Animation Using XML- Markup Hybrid Animation Using Frames with Tween.

UNIT V   **(15 Hours)**

Digital Video: Streaming Video, MediaPlayer, and MediaController classes-Android Service Class and Threads: Background Processing- Android Content Providers: Providing Data to Applications.

* denotes Self Study

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Book

1. Wallace Jackson, (2014), "Android Applications for Absolutes Beginners", Third Edition, Publisher Apress.

Reference Books

1. W. Frank Ableson Robi Sen Chris King,(2011), "Android in Action", Second Edition - Manning Publications,.

2. Shawn Van Every, "Pro Android Media: Developing Graphics, Music, Video, and Rich Media Apps for Smartphones and Tablets ".

MAPPING

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

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

Programme code:10	Bachelor of Computer Applications		
Title of the Paper	**Client /Server Techniques**		
Batch 2021-2022	Hours / Week 6	Total Hours 90	Credits 5

UNIT I   **(17 Hours)**

Client Server Computing – What is Client / Server? –File servers, Database Servers, Transaction Servers, Groupware Servers, Object Servers, Web Servers – FAT Servers or Client / Server building blocks.

UNIT II   **(18 Hours)**

Client / Servers and Operating Systems - The Anatomy of Server program – Needs of Client / Server from OS - Server scalability - Client Anatomy - Client Server Hybrids. NOS: Creating the single system image – Peer - to- Peer communication – Remote Procedure Calls (RPC) - Messaging and Queuing: The MOM Middleware - MOM vs RPC.

UNIT III   **(18 Hours)**

Distributed System Management Standards: The Internet Management Protocols- Defining management information – SMI and MIB-II-MIB tools – The Internet's SNMP limitations – Stretching SNMP's limits – OSI Management Framework – Tiny agents. Client / Server Tools and Application Development – Application Development Tools –
Client / Server Application Design.

UNIT IV   **(19 Hours)**

Client / Server Transaction Processing – The ACID properties – Transaction Models –TP Monitors - Transaction management standards. Client / Server Groupware: Importance of Groupware – What is Groupware? – The Components of Groupware – Distributed objects and components – What distributed objects promise? – From distributed objects to ComponentS – 3 tier Client / Server , Object style – Distributed objects, CORBA 2.0 – CORBA object services – CORBA common facilities – CORBA Business objects – **Compound Documents*.**

UNIT V   **(19 Hours)**

Web Client / Server – What is URL? – Shortest HTML tutorial – HTTP – 3 tier client / server , Web style – HTML Web based forms – CGI: The server side of the Web – Web security – The Internet and the Intranets – JAVA and HOT Java – Applets, Components, JAVA style – The JAVA Libraries , JDBC – Java meets CORBA – Compound Documents and object Web – **The DCOM / OLE object web*** – The CORBA Object Web.

*denotes Self study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Book
1. Robert Orfali, Dan Harkey, Jeri Edwards (2009), "The Essential Client / Server Survival Guide ", Galgotia Publications Pvt. Ltd. , Third Edition.

Reference Book
1. Doug Lowe (1995), "Client / Server Computing for Dummies"– Comdex – First Edition.

2. Patrick Smith, Steve Guengerich (2002), "Client / Server Computing", - Prentice Hall of India, Second Edition.

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

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Virtual Reality**		
Batch 2021-2022	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. Understand the Virtual environment.
2. To study about Virtual Hardware's and Software's
3. To develop Virtual Reality applications

Course Outcomes (CO)

K1 to K4	CO1	Understand the features of Virtual environment
	CO2	Understand the Virtual Hardware and software's
	CO3	Identify Virtual Reality toolkits
	CO4	Implement Virtual Reality applications

Syllabus

UNIT I   **(17 Hours)**

Virtual Reality and Virtual Environment: Introduction – Computer graphics – Real time computer graphics –Flight Simulation – Virtual environments –What is required? – The Benefits of virtual reality. **The Historical development of VR**: Introduction – Scientific Landmark.

UNIT II   **(18 Hours)**

3D Computer Graphics: Introduction – The Virtual world space – The perspective projection – Human vision – Stereo perspective projection – 3D clipping – Colour theory – Simple 3D modelling– Illumination models – Reflection models – Shading algorithms- Radiosity – Hidden Surface Removal – Realism-Stereographic image.

UNIT III   **(19 Hours)**

A Generic VR system: Introduction – The virtual environment – The Computer environment–VR Technology – Model of interaction –VR Systems.

Animating the Virtual Environment: Introduction –The dynamics of numbers -The animation of objects - Shape & object in betweening – Free from deformation–Particle system.

UNIT IV   **(19 Hours)**

Human factors: Introduction – The eye - The ear- The somatic senses. **VR Hardware:** Introduction – Sensor hardware –Head-coupled displays –Acoustic hardware –Integrated VR systems.

UNIT V   **(17 Hours)**

Virtual Reality Software: Introduction –Modelling virtual world –Physical simulation-VR toolkits. **Virtual Reality Applications:** Introduction- Engineering – Entertainment – Science – Training.

Text Book:

     1. John Vince (2007), "Virtual Reality Systems ", Pearson Education Asia.

Reference Books:

     1. Adams (2000), "**Visualizations of Virtual Reality**", Tata McGraw Hill.

     2.Grigore C. Burdea, Philippe Coiffet (2006) , "Virtual Reality Technology", Wiley Interscience, 2ndEdition.

MAPPING

PSO / CO	PSO1	PSO2	PSO3	PSO 4	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

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

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	**Cloud Computing and Azure**		
Batch 2021-2022	Hours / Week 5	Total Hours 75	Credits 2

Course Objectives

1. To learn the concept of Cloud Computing basics.
2. To learn the Cloud storage and Standards .
3. To learn the concepts Azure and Azure documentation.

Course Outcomes (CO)

	CO1	Understand the concept of Cloud Computing
K1 to K4	CO2	Understand and deploy Web applications using Azure concept
	CO3	Acquire knowledge about Azure virtual machine and Azure storage
	CO4	Develop and test real time scenarios using Azure concept

Syllabus

UNIT-I (15 Hours)

Cloud Computing Basics: Cloud Computing Overview – Applications – Intranets and the Cloud. **Hardware and Infrastructure:** Clients– Security – Network - Services.

UNIT-II (15 Hours)

Accessing the Cloud : Platforms – Web Applications – Web Browsers. **Cloud Storage:** Overview – Cloud Storage Providers. **Standards:** Application – Client – Infrastructure – Service.

UNIT III (15Hours)

Getting started with Microsoft Azure: What is Azure? Azure Resource Manager- PowerShell changes for the Resource Manager and classic deployment models- Role-Based Access Control - The Azure portal - Subscription management and billing - Azure documentation and samples.

UNIT IV (15 Hours)

App Service and App Service plans - Creating and deploying Web Apps - Configuring, scaling, and monitoring Web Apps .

*What is Azure Virtual Machines? Virtual machine models- Virtual machine components - Create virtual machines - Connecting to a virtual machine - Configuring and managing a virtual machine - Scaling Azure Virtual Machines.

UNIT V   **(15 Hours)**

Azure Storage - Storage accounts- Storage services- Security and Azure Storage - Creating and managing storage: Create a storage account using the Azure portal, Create a file share and upload files using the Azure portal, Create a table and add records using the Visual Studio Cloud Explorer, Create a storage account using PowerShell, Create a container and upload blobs using PowerShell, AzCopy: A very useful tool , The Azure Data Movement Library.

Text Book

1. Anthony T.Velte ,Toby J.Velte, Robert Elsenpeter ,(2010) "Cloud Computing – A Practical Approach".TMH (UNIT I, UNIT II)
2. Michael Collier, Robin Shahan*, "*Fundamentals of Azure" Second Edition.

Reference Book

1. Rajkumar Buyya, Christian vecchiola , Thamarai selvi,(2013) "Mastering Cloud computing", Mc Gram Hill Edu, (UNIT II, UNIT IV)
2. Haley Beard, (July 2008) "Cloud Computing Best Practices for measuring processes for on demand computing, Applications and data centers in the cloud with SLA's " .
3. Michael Miller , (2009)" Cloud computing – Web based application " , Pearson Edu Inc, First Impression.
4. Hash Bai,Steve Maier,Dan StoltsArchitecting , "Microsoft Azure Solutions"Eastern Economy Edition.

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

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

UCA 44

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	**Part IV -Non Major Elective –I Human Rights**		
Batch 2021-2022	**Hours / Week 2**	**Total Hours 30**	**Credits 2**

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.

UNIT – I

Definition, Meaning, Concept ,Theories and Kinds of Human Rights-Evaluation and Protection of Human Rights in India- Development of Human Rights under the United Nations.

UNIT – II

United Nations Charter and Human Rights - U.N.Commission on Human Rights-Universal Declaration of Human Rights - International Covenant on

- Civil & Political Rights
- Economic, Social and Cultural Rights

UNIT – III

Human Rights and Fundamental Rights (Constitution) - Enactments regarding Human Rights Laws in India - National Human Rights Commission and State Human Rights Commission.

UNIT – IV

Aged persons and their Human Rights - Human Rights of Persons with Disabilities - Tribal Human Rights in India - Three Generation Human Rights.

UNIT – V

Rights of Women, Child, Refugees and Minorities - Media and Human Rights - NGO's in protection of Human Rights - Right to Election.

Books for Study:
1. Human Rights(2019)   Published by Kongunadu Arts and
                                                 Science College,Coimbatore-29

Book for Reference:
1.Human Rights,(2018)

   Jaganathan,MA.,MBA.,MMM.,ML.,ML.,
   Humanitarian Law and   J.P.Arjun Proprietor,Usha Jaganathan
   Refugee Law   law series, 1ˢᵗ floor,
                                           Narmatha Nanthi
                                           Street, Magathma Gandhi Nagar,
                                           Madurai – 625014.

2. Promoting Women's Rights   Publisher : United Nations.
   As Human Rights   New York., 1999.

Question Paper Pattern

(External only)

Duration: 3 hours   **Max: 75 marks**

                                           Section A   **(5X5=25)**

Short notes
Either – Or/ Type - Question from each unit

                                           Section B   **(5X10=50)**

Essay type
Either – Or/ Type - Question from each unit

Sub.Code: 21UWR4N2

NON MAJOR ELECTIVE-II WOMEN'S RIGHTS

Total Hours of Teaching: 30   **Total Credits: 2**

OBJECTIVES:

➢ To know about the laws enacted to protect women against violence.

➢ To impart awareness about the hurdles faced by women.

➢ To develop a knowledge about the status of all forms of women to access to justice.

➢ To create awareness about women's rights.

➢ To know about laws and norms pertaining to protection of women.

➢ To understand the articles which enables the women's rights.

➢ To understand the Special Women Welfare laws.

➢ To realize how the violence against women puts an undue burden on health care services.

UNIT -I   **(6 Hours)**

Laws, Legal System & Change

Definition- Constitutional law, CEDAW and international human rights-law and norms-laws and social context-constitutional and legal frame.

UNIT -II   **(6 Hours)**

Politics of Land and Gender in INDIA

Introduction-faces of poverty-land as productive resources-locating identities-women's claim to land –rights of properties-case studies.

UNIT -III   **(6 Hours)**

Women's Rights: Access to Justices

Introduction-criminal law-crime agent women-domestic violence-dowry related harassment and dowry deaths-molestation-sexual abuse and rape-loopholes in practice-laws enforcement agency.

UNIT -IV   **(6 Hours)**

Women's Right

Violence against-women-domestic violence-the protection of women from domestic violence act, 2005-The Marriage Validation Act, 1982-The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961.

UNIT -V **(6 Hours)**

Special Women Welfare Laws

Sexual harassment at work place-rape and indecent representation-the indecent representation act, 1956-acts enacted for women development and empowerment-role of rape crisis center.

Book for study : Published by Kongunadu Arts & Science College, 2011.

Books for reference:

1. Good Women do not Inherit land	Nitya Rao, Social Science Press and Orient Blackswan (2008).
2. Knowing Our Rights	An Impart for Kali for Women (2006). International solidarity network.
3. Women Rights	P.D.Kaushik, Bookwell Publications (2007).
4. Violence Protective Measures for Women Development and Empowerment	Aruna Goal, Deep and Deep Publications Pvt. (2004).
5. Gender Justice	Monika Chawla, Deep and Deep Publications Pvt. (2006).
6. Domestic Violence Against Women	Preeti Mishra, Deep and Deep Publication Pvt. (2007).
7. Violence against Women	Clair M. Renzetti, Jeffrey L. Edleson, Raquel Kennedy Bergen, Sage Publications (2001).

Question paper pattern

(External Only)

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.

NON MAJOR ELECTIVE : CONSUMER AFFAIRS

Total Hours of Teaching: 30   **Total Credits: 2**

OBJECTIVES

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, and the role of different agencies in establishing product and service standards.
3. To have a handle the business firms' interface with consumers and the consumer related regulatory and business environment.

Course Outcomes (CO)

K1	CO1	Able to know the rights and responsibility of consumers.
K2	CO2	Understanding the various procedure of redress.
K3	CO3	Applying the role of different agencies in establishing product and service standards.
K4	CO4	To enable them to handle the business firms' interface with consumers.

Syllabus

UNIT I   **(15 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 10000 suite

UNIT II   **(15 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 Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA with important case law.

UNIT III   **(15 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 (15 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   **(15 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, 1986. Any change in law would be added appropriately after the new law is notified.

Suggested Readings:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi, (2007),**" Consumer Affairs"**, Universities Press.

2. Choudhary, Ram Naresh Prasad (2005),**"Consumer Protection Law Provisions and Procedure"**, Deep and Deep Publications Pvt Ltd.

3. G. Ganesan and M. Sumathy, (2012), **"Globalisation and Consumerism: Issues and Challenges"**, Regal Publications

4. Suresh Misra and Sapna Chadah ,(2012),**"Consumer Protection in India: Issues and Concerns"**, IIPA, New Delhi

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, 1986 and its later versions.

MAPPING

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

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

21EVS101

SEMESTER I

PART IV – ENVIRONMENTAL STUDIES

Total Credits: 2   **Total Hours: 30**

Objectives:

- 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.

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   (6 Hours)

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 – 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 -.

Self Study (Questions may be asked from these topics also)

Text Book

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

Reference Books

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.

21VED201
SEMESTER – II
PART – IV VALUE EDUCATION: MORAL AND ETHICS

Total Hours: 30
Total Credits: 2
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.

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)
    Life and Teachings of Swami Vivekananda: Birth and Childhood days of Swami Vivekananda – At the Parliament of Religions – Teachings of Swami Vivekananda
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)
    Physical Fitness and Mental Harmony: Simplified Physical Exercise – Hand Exercises – Leg Exercises – Neuro Muscular Breathing Exercises – Eye Exercises – Kabalabathi – Maharasana A & B – Massage - Acupressure – Relaxation – Kayakalpa Yogam - LifeForce – Aim & Objectives – Principle – Methods. Introspection – Analysis of Thoughts – Moralization of Desires – Neutralization of Anger – Eradication of Worries
UNIT V:
(8 Hours)
    Yoga and Meditation – The Asset of India: Yogasanam – Rules & Regulations – Surya Namaskar – Asanas –Sitting – Stanging – Prone - Supine - Pranayama – Naadi Sudhi – Ujjayi – Seethali – Sithkari - Benefits. Meditation – Thanduvasudhi - Agna – Shanthi – Thuriyam – Benefits.
Text Book:
    Value Based Education – Moral and Ethics – Published by Kongunadu Arts and Science College (Autonomous), First Edition (2020).
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).
5. Yoga Practices - 1 – The World Community Service Centre – Vethathiri Publications,
   Sixth Edition (2017),Erode.
6. Yoga Practices - 2 – The World Community Service Centre – Vethathiri Publications –
   Eighth Edition (2017),Erode.

UCA 54

KONGUNADU ARTS AND SCIENCE COLLEGE

[AUTONOMOUS] COIMBATORE - 641 029

End Semester Examination Question Paper Pattern

[For the candidates admitted from the academic year 2014 Onwards]

BACHELOR OF COMPUTER APPLICATIONS [BCA]

Time: 3 Hours   **Maximum Marks: 75 Marks.**

Answer all of the following questions

Section – A

10 x 1 = 10

[10 Questions]

(Two questions from each unit. Questions shall be in the form of multiple choices)
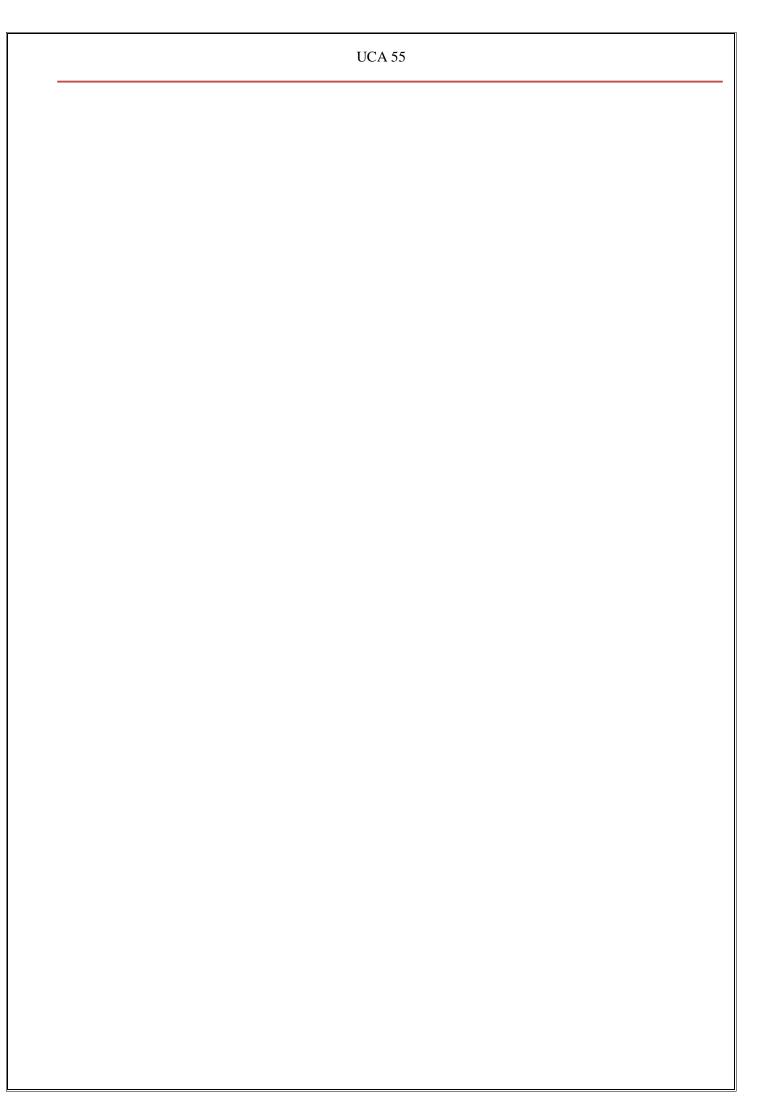
Section – B

5X5 = 25

Five questions either or type

(One question from each unit)

Section – C

5 X 8 = 40

Five questions either or type

(One question from each unit)

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 2022-2023)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	CIA	ESE	TOTAL	Duration of Exam (hours)	Credits
I	I	22TML1A1	Language I@	6	50	50	100	3	3
	II	22ENG101	English -I	6	50	50	100	3	3
	III	22UCA101	Core Paper 1 - C Programming	5	50	50	100	3	4
	III	22UCA1CL	Core Practical 1 - C Programming Lab	5	50	50	100	3	2
	III	22UCA1A1	Allied Paper 1 - Computer Oriented Numerical and Statistical methods	6	50	50	100	3	5
	IV	22EVS101	Environmental Studies **	2	-	50	50	3	2
			Total	**30**	**-**	**-**	**550**	**-**	**19**
II	I	22TML2A2	Language II@	6	50	50	100	3	3
	II	22ENG202	English –II	6	50	50	100	3	3
	III	22UCA202	Core Paper 2 - Object Oriented Programming with C++	4	50	50	100	3	3
	III	22UCA203	Core Paper 3 – Digital Fundamentals and Microprocessor	3	50	50	100	3	2
	III	22UCA2CM	Core Practical 2- Object Oriented Programming with C++ Lab	3	50	50	100	3	2
	III	22UCA2A2	Allied Paper 2 - OperationsResearch	6	50	50	100	3	5
	IV	22VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
			Total	**30**	**-**	**-**	**650**	**-**	**20**
III	I	22TML3A3	Language III@	6	50	50	100	3	3
	II	22ENG303	English –III	6	50	50	100	3	3
	III	22UCA304	Core Paper 4 - Data Structures with Java Programming	4	50	50	100	3	5
	III	22UCA3CN	Core Practical 3 - Data Structures with Java Programming Lab	4	50	50	100	3	5
	III	22UCA3A3	Allied Paper 3 – Business Accounting	6	50	50	100	3	5
	IV	22UGC3S1	Skill Based subject 1- Cyber Security	2	100	-	100	3	3
	IV	22TBT301/ 22TAT301/ 22UHR3N1	Basic Tamil* / Advanced Tamil**/ Non-major elective- I**	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**26**
IV	I	22TML4A4	Language IV@	6	50	50	100	3	3
	II	22ENG404	English –IV	6	50	50	100	3	3
	III	22UCA405	Core Paper 5 - .net framework with Oracle	4	50	50	100	3	4
	III	22UCA4CO	Core Practical 4 -.net framework with Oracle Lab	4	50	50	100	3	3
	III	22UCA4A4	Allied Paper 4 – Distributed Operating System	5	50	50	100	3	5
	IV	22UCA4SL	Skill Based subject 2- Linux Programming Lab	2	25	25	50 @@	3	1
	IV	22UCA4NM ###	Office Fundamentals: Digital Skills for Employability http://kb.naanmudhalvan.in/Special:Filepath/Microsoft_Course_Details.xlsx	1	25	25	50 ##		2
	IV	22TBT402/ 22TAT402/ 22UWR4N2	Basic Tamil* / Advanced Tamil**/ Non-major elective- II**	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**23**

UCA 2

V	III	22UCA506	Core Paper 6 - Software Engineering	6	50	50	100	3	4
	III	22UCA507	Core Paper 7 - Data Mining with R Programming	6	50	50	100	3	5
	III	22UCA508	Core Paper 8 - Artificial Intelligence and Expert Systems	6	50	50	100	3	5
	III	22UCA5CP	Core Practical 5 - Data Mining with R Programming Lab	5	50	50	100	3	3
	III	22UCA5E1	Major Elective 1	5	50	50	100	3	5
	IV	**-**	**EDC**	2	100	-	100	3	3
	-	**22UCA5IT**	**Internship Training ******	Grade					
			Total	**30**	**-**	**-**	**600**	**-**	**25**
VI	III	22UCA609	Core Paper 9 - Web Designing	5	50	50	100	3	5
	III	22UCA610	Core Paper 10 – Python Programming	6	50	50	100	3	5
	III	22UCA6CQ	Core Practical 6 - Web Designing Lab	6	50	50	100	3	3
	III	22UCA6E2	Major Elective 2	5	50	50	100	3	5
	III	22UCA6Z1	Project***	4	50	50	100	-	5
	IV	22UCA6SM	Skill Based subject 3- Python Programming Lab	2	25	25	50 @@	3	1
	IV	22UCA6NM ###	Project Based Learning: Advanced Platform Technology / Data Analytics & Visualization http://kb.naanmudhalvan.in/images/3/3d/IBM_PBL.pdf	2	25	25	50 ##		2
			Total	**30**	**-**	**-**	**600**	**-**	**26**
	V	22NCC $/NSS/YRC /PYE/ECC/RRC/ WEC101#	Cocurricular Activities*	-	50	-	50	-	1
			Grand Total	**-**	**-**	**-**	**3800**	**-**	**140**

Note :

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

@@ End semester examination will be conducted for 50 marks and the marks will be converted to 25 marks.

Naan Mudhalvan Course: End of semester will be assessed by Industry for 25 marks and CIA will be done by the course teacher.

The course can be opted to suit the skill set requirement of the core domain from the courses provided by the Bharathiar University and the same may be intimated to the COE during the beginning of that particular semester.

$ 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 – 22HIN/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 – 35 marks; Viva voce – 15 marks; Internal-50 marks

**** 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. Internet of Things
2. Multimedia System
3. Software Project Management
4. Block Chain
5. Information Security
6. Fuzzy logic

Non-Major Elective Papers

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

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

22UCA5XL - 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)

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.

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**

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UCA 4

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- ➢ 50 % CIA is applicable to all subjects except EDC, JOC, COP and SWAYAM courses which are considered as extra credit courses.

- ➢ The students to complete any **MOOC on learning platforms like SWAYAM, NPTEL, Course era, IIT Bombay Spoken Tutorial etc.,** 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.

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

Components of Continuous Internal Assessment (50 Marks)

Components		Marks	Total
Theory			
CIA I	75	(75+75) converted to 30	50
CIA II	75		
Problem based Assignment**		10	
Attendance		5	
Others*		5	
Practical			
CIA Practical		(50) converted to 30	50
Observation Notebook		15	
Attendance		5	
Practical			
CIA Practical		(25) converted to 10	25
Observation Notebook		10	
Attendance		5	
Project			
Review		45	50
Regularity		5	

* Class Participation, Case Studies Presentation, Field Work, Field Survey, Group Discussion, Term Paper, Workshop/Conference Participation. Presentation of Papers in Conferences, Quiz, Report/Content writing. Etc.

** Two Assignments to be given. (Each 5 marks).

UCA 5

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

Theory Examination – Part I, II, III & IV (SBS only)

i) <u>CIA I & II and ESE: 75 Marks</u>

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

**For ESE 75 marks converted to 50 marks.

ESE Practical Examination:

Option 1 :

Knowledge Level	Section	Marks	Total
K3	Experiments	45	
K4		05	50
K5	Record Work		

Knowledge Level	Section	Marks	Total
K3	Experiments	20	
K4		05	25
K5	Record Work		

ESE Project Viva Voce:

Option 1:

Knowledge Level	Section	Marks	Total
K3	Project Report	35	
K4		15	50
K5	Viva voce		

UCA 6

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 1 – C Programming		
Batch 2022-2025	Hours / Week 5	Total Hours 75	Credits 4

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 impart adequate knowledge of programming languages and problem-solving techniques.

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 – 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*.**

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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 FunctionArguments- Functions returning pointers. The Preprocessor: 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 Operationson Files – Command Line Arguments.

* 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, (2008), **"Programming in ANSI C",** Eighth Edition -Tata McGraw Hill
Reference Books
1. Ashok N Kamthane, (2007), **"Programming with ANSI and Turbo C",** Pearson Education Publication.

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

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

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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 9

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 1 - C Programming Lab		
Batch 2022-2025	Hours / Week 5	Total Hours 75	Credits 2

Course Objectives

1. To introduce C Programming concepts to develop the programming knowledge.

2. To enhance their analyzing 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.

Course Outcomes (CO)

K3 to K5	CO1	Learning process helps in deep understanding the concepts of C language.
	CO2	Applying the various basic programming constructs like decision making statements, looping statements, functions, structures, pointers etc.,
	CO3	Developing programs using control statements, Arrays and Strings.
	CO4	Enabling effective usage of arrays, structures, functions and pointers.
	CO5	Implementing the files and command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a program to find the median for a given set of numbers.

2. Write a program to find the Standard Deviation for a given set of numbers.

3. Write a program to find the number of palindrome strings in a given sentence.

4. Write a program to generate N Prime and Armstrong numbers.

5. Write a program to perform Matrix addition & Multiplication using Arrays.

6. Write a program to calculate NCR using the formula NCR = N! / (R! * (N-R)!) Using functions.

7. Write a program to print Fibonacci Series using Recursive Function.

8. Write a 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 program to perform string manipulation operations.

10. Write a program to perform all manipulations like insertion, deletion and modification in files for student mark list.

11. 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 / 50 Marks)

    1. Record Work - 5 Marks
    2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

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 11

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 2 – Object Oriented Programming with C++		
Batch 2022-2025	**Hours / Week 4**	**Total Hours 60**	**Credits 3**

Course Objectives

1. To perform object- oriented programming to develop solutions to problems demonstrating usage of control structures, modularity, I/O and other standard language constructs.

2. To develop an in-depth understanding of functional, logic, and object-oriented programming paradigms.

3. To program using more advanced OOP's features such as objects, operator overloading, dynamic memory allocation, inheritance and polymorphism, File I/O.

Course Outcomes (CO)

K1 to K5	CO1	Understanding the features of C++ Programming.
	CO2	Understanding the advanced features of C++ specifically, Operator Overloading, Templates, Streams.
	CO3	Applying the major object-oriented concepts to implement programs, Inheritance and Polymorphism
	CO4	Implementing different Operations on Functions, Classes & Object, and Constructors.
	CO5	Evaluate the usage of object oriented programming in terms of software reuse and managing complexity to solve real-world problems.

Syllabus

UNIT I   (13 Hours)

Procedure Oriented Programming – Basic Concepts of Object-Oriented Programming - Beginning with C++ - Expression & Control Structure: Data Types – Reference Variables – Operators in C++ - Scope Resolution Operator – Type Cast Operator – Branching & Looping.

UNIT II   (13 Hours)

Functions: Function Prototypes – Call by Reference – Return by Reference – Inline Functions – **Default & Const Argument *-** Function Overloading – Friend Functions.

UNIT III   (12 Hours)

Classes & Objects – Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default arguments – Copy Constructors – Destructors.

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UNIT IV   **(11 Hours)**

Operator Overloading – Inheritance: Defining derived class – Types of inheritance – Virtual Base Class. Pointers: This pointer – Pointers to Objects – Virtual functions & Polymorphism – Templates.

UNIT V   **(11 Hours)**

Working with Files: Classes for file stream operation - Opening and closing a file – File pointers and their manipulations – Command Line Arguments.

* **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 Book

1. E.Balagurusamy, (2020), "Object Oriented Programming with C++", Eighth Edition - Mc Graw Hill Publications.

Reference Books

1. Ashok N. Kamthane, (2003) **-** "Object oriented Programming with ANSI and Turbo C++", FirstEdition - Pearson Education Publication.

2. Yashavanth Kanetkar, (2008), "Let us C++", Fourth Edition - BPB Publications.

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	S	S

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

UCA 13

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 3 – Digital Fundamentals and Microprocessor**		
Batch 2022-2025	**Hours / Week 3**	**Total Hours 45**	**Credits 2**

Course Objectives

1. To learn the concept of Digital Circuits, Circuit Constructions and Simplifications of Boolean function.
2. To gain an in-depth knowledge about the different types of number systems and number Conversions.
3. To teach the architecture and instruction set of Basic Microprocessors and the Architecture of Microcontrollers, and Peripherals.

Course Outcomes (CO)

	CO1	Understanding the Basic Digital Computer System.
	CO2	Remember the Gates, Number systems and conversions.
K1 to K5	CO3	Remember the basic architecture of 16 and 32-bit microprocessors.
	CO4	Analyze the Various I/O devices and Drivers.
	CO5	Analyze the Various Ports in Digital system and USB.

Syllabus

UNIT I (8 Hours)

Programming the Basic Computer: Introduction –Different types of computer systems – Basic components of a digital computer system – Programming languages. Central Processing Unit: Introduction – General Register Organization.

UNIT II (10 Hours)

Number System and Codes: Binary Number System – Binary-to-decimal Conversion – Decimal-to-binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code - Gray Code. Digital Logic: The Basic Gates – NOT, OR, AND Gates. The Universal Gates – NOR, NAND.

UNIT III (10 Hours)

8086 Microprocessor: Introduction – general organization of a Microcomputer - 8086 internal Architecture- **Addressing modes** * – Instructions set. The 8086 based system design: Pins and Signals - Pin Configuration, Signals, Interfacing Memory-Memory Devices, Memory Banks.

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UNIT IV **(9 Hours)**
Drives: Introduction – Principles of Magnetic Storage – **Floppy Disk Drive – Hard disk drive –**

CD- ROM Drive*. Peripherals: Video display system – Keyboard -Printer.

UNIT V **(8 Hours)**
Parallel & Serial Ports: Parallel port – Standard Parallel port (SPP) - Enhanced Parallel port

EPP) –BIOS serial port services. Universal Serial Bus: Introduction – Features of USB –

USB System - USB Transfer – USB Controller.

* **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. Thomas C Bartee, (2008), **"Digital Computer Fundamentals"**, Tata McGraw Hill
   Publications, New Delhi, 6th Edition, (28th Reprint), (Unit – I).
2. Morris Mano, (2011), "**Digital Logic and Computer Design",** Zeroth Edition, Prentice Hall of
   India, New Delhi, (13th Impression) - (Units II).
3. N.Mathivanan, (2005), **Microprocessors, PC Hardware and Interfacing,** Fourth Edition,
   PHI Publications, New Delhi. (Units III, IV & V).

Reference Book

1 . Thomas C. Bartee, (1998), "**Computer Architecture and Logical Design**", Mc Graw Hill
International Edition.

2. John P Hayes, (1998), "**Computer Architecture and Organization**"- Third Edition ,
   McGraw Hill International.
3. Aditya P.Marthur, (2002), **Introduction to Microprocessors**, Third Edition, TMH.
4. Brey.Barry.B, ShramaC.R, (2007), **The Intel Microprocessors,** First Edition, PHI Publications.

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MAPPING

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

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

UCA 16

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 2 – Object Oriented Programming with C++ Lab		
Batch 2022-2025	Hours / Week 3	Total Hours 45	Credits2

Course Objectives

1. To develop programming skills using object - oriented concepts.

2. To develop the ability to write a program to solve specific problems.

3. To practice the fundamental methodology to implement file and I/O stream concepts.

Course Outcomes (CO)

K3 to K5	CO1	Apply the various basic programming constructs like decision making statements, Looping statements, functions, concepts like overloading, inheritance, polymorphism, virtual functions, constructors and destructors.
	CO2	Designing programs using appropriate predefined functions and classes in C++.
	CO3	Developing applications using Friend functions, Inheritance and polymorphism.
	CO4	Developing a C++ application using the concepts of Templates, stream I/O, Files and usage of the available classes to handle stream objects.
	CO5	Evaluate the implementation of command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Develop a C++ Program to implement the concept of classes and objects.

2. Write a C++ Program to implement the types of Functions.

3. Develop a C++ Program to implement the concept of Function overloading.

4. Construct a C++ program to implement the concept of Constructors.

5. Develop a C++ Program to implement the concept of Operator overloading.

6. Develop a C++ Program to implement the concept of Inheritance.

7. Construct a C++ Program to implement the concept of Polymorphism using Virtual Functions.

8. Write a C++ program to swap two numbers using the concept of Function Templates.

9. Write a C++ program to perform White Space Suppression in a file.

10. Write a program that performs file copy using command line arguments.

Teaching Methods

Smart Classroom, ~~Projectors,~~

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 50 Marks)

1. Record Work - 5 Marks

2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	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	S	H	H	S	S

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 4 – Data Structures with Java Programming		
Batch 2022-2023	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To obtain the basic knowledge of Data Structures and Object-Oriented Programming using the core Java programming language.

2. To understand the fundamentals of Constructors, Method Overloading, Arrays and Error handling mechanisms in Java and gaining knowledge about Stack and Queue, Sorting Techniques using Data Structures.

3. To inculcate the principles of Interfaces, Packages, Applets, Graphics Programming in Java and concepts in data structures such as Linked lists, Trees and Graphs.

Course Outcomes (CO)

K1 to K5	CO1	Acquiring knowledge java programming language for various programming technologies using data structure concepts.
	CO2	Understanding and applying concepts of Overloading and Interface. Arrays and Exception handling in java programming language.
	CO3	Analyzing the concepts of Stack, Queue with Sorting Techniques.
	CO4	Implementing java concepts with Linked lists, Trees and Sorting Techniques.
	CO5	Evaluating the types of graphs with relevant case studies.

Syllabus

UNIT I **(Hours:12)**

Object Oriented Programming- Classes, Creating Objects, Accessing objects methods, Constructors, Inheritance and Polymorphism. Basics of Arrays in Java- One Dimensional Arrays- Creating Array- Two dimensional Arrays. Managing Errors and Exceptions.

UNIT II **(Hours:12)**

Constructors- Method Overloading- Overriding Methods. Interfaces: Multiple Inheritance. Applet programming: Introduction-How applet differs from other applications-Applet Life cycle- Applet Tag, *Packages. Graphics programming: Introduction- The Graphics Class-Lines and Rectangles-Circles and Ellipses- Drawing Arcs Using Control Loops in Applets.

UNIT III **(Hours:12)**

Overview of Data Structures and Algorithms- Linear Search and Binary Search, Ordered Array. Overview of Stacks and Queues: Stack Class methods, Error Handling, Circular Queue and methods, Deque and Priority Queue .

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UNIT IV   **(Hours:12)**

Overview of Linked List and list operations, Sorted List and Unsorted List- Anagram and Towers of Hanoi. Simple Sorting- Bubble Sort, Selection Sort and Insertion Sort.   Binary Trees: Preorder and Post order Traversal - Red Black Trees: Balanced and Unbalanced Trees. Heaps –Heap sort.

UNIT V   **(Hours:12)**

Graphs: Overview, Vertices, Edges, Adjacency Matrix, Adjacency List, Depth first Search, Breadth First Search. Weighted Graphs: Minimum Spanning Tree with weighted Graphs, Shortest Path Problem. **Case Studies for Weighted Graphs using Virtual Lab.**

* 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.

2.Robert Lafore, "**Data Structures and Algorithms in Java**", Sams Publications, 2003.

Reference Books:

1.   Robert Lafore, "**Data Structures and Algorithms in Java**", Mitchell Waite
          Publications, 1998.

2.   Surbhi Kakar, "Java Programming", Wiley India Publication, 2019.

3.   Michael T. Goodrich , Roberto Tamassia, "**Data Structures and Algorithms in Java"**
          John Wiley & Sons Publication, Fourth Edition.

UCA 20

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 21

Programme Code : 10	Bachelor of computer applications		
Title of the paper	Core Practical 3 – Data Structure with Java Programming Lab		
Batch 2022-2023	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To understand the use of Data Structures and Java Programming.

2. To apply the principle concepts of data structures in Java.

3. To analyze the techniques followed in this practical paper.

Course Outcomes (CO)

K3 to K5	CO1	Designing the basic concepts of Data structures and Java Programming.
	CO2	Implementing types of search in data structures using Java.
	CO3	Validating the various fundamental concepts of Stack and Queue.
	CO4	Implementing concepts of linked lists and sorting techniques.
	CO5	Evaluate the nodes and Tree concepts

LIST OF PRACTICAL PROGRAMS

1. Write a java program to implement linear search.

2. Implement the concept of binary search using java.

3. Write a java program to implement the top element using Stack.

4. Write a java program to implement the concept of Queue Interface.

5. Implement a java program to display the first and the last element of a linked list

6. Write a Java program to demonstrate the working of Priority Queue.

7. Implement the concept of Selection sort using Applets.

8. Write a Java programs for implementing the Bubble sort

9. Write a Java programs for implementing the Insertion sort.

10. Write a java program to delete the nodes and the tree.

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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 / 50 Marks)

1. Record Work - 5 Marks

2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

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 23

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Skill Based Subject 1 – Cyber Security**		
Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 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.

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.

Sub.Code: 22UGC3S1

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,

2. Govt. of India

3. http://cybercellmumbai.gov.in/ - Cybercrime investigation cell

4. http://ncrb.gov.in/ - National Crime Records Bureau

5. http://catindia.gov.in/Default.aspx - Cyber Appellate Tribunal

6. http://www.cert-in.org.in/ - Indian Computer Emergency Response Team

7. http://cca.gov.in/rw/pages/index.en.do - Controller of Certifying Authorities

8. www.safescrypt.com - Safescrypt

9. www.nic.in – National Informatics Centre

10. https://www.kaspersky.com/resource-center/definitions/what-is-a-digital-footprint

11. https://geekflare.com/digital-footprint/

Sub.Code: 22UGC3S1

Mapping

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

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

UCA 26

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 5 – .NET Framework with Oracle**		
Batch **2022 - 2023**	**Hours / Week** **4**	**Total Hours** **60**	**Credits** **4**

Course Objectives

1. To design and develop the distributed event driven programming in both VB and .Net framework.

2. To analyze the Properties, Events and Methods CLR,

3. To apply .NET framework classes in .Net Environment.

4. To develop the knowledge in various Database concepts, queries, normalization and reports.

5. To be able to construct a new normalized database.

Course Outcomes (CO)

K1 to K5	CO1	Remember the basic Visual basic concepts and advanced features of VB.Net.
	CO2	Understand the concepts of .Net framework Technology and summarize the advantages and disadvantages of .Net framework.
	CO3	Apply the windows forms and menu contols using VB.Net.
	CO4	Apply various DDL and DML statements, joins queries, PL / SQLstatements.
	CO5	Analyze the granting and revoking permissions in cursors and Normalization forms.

Syllabus

UNIT I   **12 Hours**

Essential Visual Basic – Upgrading from Visual Basic - .Net Frame work and the CLR – IDE–Building VB.Net Applications. Operations – Conditionals and Loops – Procedures, Scope and Exception Handling.

UNIT II   **12 Hours**

Windows Forms – Adding Controls – Handling Events – Creating MDI applications –Textboxes, Rich Text boxes, Labels – Buttons, Check boxes, Radio buttons, panels and Group boxes – List box, **Checked list box***, Combo box and Picture b

UNIT II   **12 Hours**

Windows Forms – Scroll bars, Splitters, Track Bars, Pickers, Notify Icons, Tool tips and Timers. Menus – Built in Dialog Boxes – Image list, Tree and List view, Toolbars, Status bars and progress bars and tabbed controls.

UNIT IV   **12 Hours**

Interactive SQL : Invoking SQL * Plus- data definition- data manipulation in DBMS – The oracle data types – DML and DDL statements-Data constraints - arithmetic, logical operators-oracle functions - grouping data from tables - manipulating dates - union, intersect and minus clause - Granting permissions - Revoking permissions - Codd's Rules.

UNIT V   **12 Hours**

PL/SQL: Introduction, PL/SQL syntax, understanding PL/SQL block structure, oracle transactions, cursors, stored procedures, stored functions, database triggers – **Creating Default Tabular Report***.

SQL: Nested Sub queries - Derived Relations – **Views** * - Joined Relations. Integrity Constraints: Domain Constraints- Referential Integrity Normalization-First Normal Form, Second Normal Form, Third Normal Form and BCNF.

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

Teaching Methods

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

TEXT BOOK

  1. Steven Holzner, (2005), **Visual Basic .NET Black Book**, First Edition, Dream Tech Publication. (Unit I,II & III)

2.Ivan Bayross, (2007), **Commercial Application Development Using ORACLE Developer 2000**, First Edition. (Unit IV & V)

3.Abraham Silberschatz, Henry F. Korth, S. Sudharshan, (2006), **Database System Concepts**, Fifth Edition, Tata McGraw Hill Publication. (Unit IV & V)

REFRENCE BOOKS

  1. Evangelos Petroustes, (2002), **Mastering Visual Basic .NET**, First Edition, BPB Publication. (Unit I,II & III)

2. Bill Evjen Beres, (2002), **Visual Basic .NET Programming Bible** Wiley –DreamTech Publication. (Unit I,II & III)

3. Bipin. C. Desai, (2000), **An Introduction to Database Systems**, First Edition, Galgotia Publication. (Unit IV & V)

4. Ivan Bay Ross(1995), **Oracle 7 - The Complete Reference**, First Edition, BPBPublications, Chennai. (Unit IV & V)

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 29

Sub. Code : 22UCA4CO

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 4 – .Net Framework with Oracle Lab		
Batch 2022 – 2023	Hours / Week 4	Total Hours 60	Credits 3

Course Objectives

1. To make the students to develop the database projects with a back end concept.

2. To construct .NET applications and to maintain the database.

3. To familiarize the students in crystal report creation.

4. To Construct the queries using DDL and DML queries and execute the console, window application, crystal report, PL/SQL triggers.

5. Apply the connectivity to retrieve the data from database.

Course Outcomes (CO)

	CO1	Apply the decision and control structures in .NET and apply the concepts of queries and creation of console applications.
	CO2	Analyze the concept of windows application and project creation and Oracle functions.
K3 to K5	CO3	Construct the queries using DDL and DML queries.
	CO4	Execute the console, window application, crystal report, PL/SQL triggers.
	CO5	Apply the connectivity to retrieve the data from database.

LIST OF PRACTICAL PROGRAMS

. NET FRAMEWORK

1. Perform Matrix Multiplication using Arrays Concept in Console Application

2. Program to simulate a simple calculator in Windows Application.

3. Program to simulate a digital clock with reset option in Windows Application

4. Develop a Simple Project, showing the process (using payroll process)

   1)Move first   2) Move Last 3) Move Previous   4) Move Next

5. Program for a notepad application in Windows Application.

6. Program to maintain student details in Windows Application.

7. Develop a Simple Project for Library Management using VB.NET as front end and ORACLE as back end and create a Crystal report.

ORACLE

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.

   ✓ Display the employee details who are all getting salary above15000.

   ✓ 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" andpin code 641029 or641001.

   ✓ Display the employee details in descending order based on name.

3. Create a table and perform the queries using comparison, logical, set, sorting andgrouping 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 Data base Triggers to check the validity of records.

8. Write PL/SQL block to partition the details of the student into two tables.

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

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

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Allied Paper 4 : Distributed Operating System**		
Batch **2022-2023**	**Hours / Week** **5**	**Total Hours** **75**	**Credits** **5**

Course objective

1. To Describe basic concepts of Operating System and Computer Networks.
2. To understand about naming, security, distributed file system.
3. To understand about message passing, remote procedure calls.
4. Understand the need of distributed shared memory, synchronization.
5. Understand the scope of resource, process management.

Course Outcome

K1 TO K5	CO1	Gain knowledge of distributed operating system architecture (Knowledge)
	CO2	Illustrate principles and importance of distributed operating system (Understand)
	CO3	Implement distributed client server applications using remote method invocation (Apply)
	CO4	Distinguish between centralized systems and distributed systems (Analyze)
	CO5	Create stateful and state-less applications (Create)

Syllabus

Unit I **(15 Hours)**

Fundamentals of Distributed Operating System: Meaning – Evolution – Models – Issues in designing Distributed Operating System.

Fundamentals of Computer Networks: Introduction – Network Types – LAN, WAN Technologies – Common Protocols.

Unit II **(15 Hours)**

Message Passing: Introduction – Features – Synchronization – Buffering – Multidatagram Message Passing – Encoding and Decoding of Message Data – Process Addressing – Failure Handling – Group Communication. **Remote Procedure Calls**: RPC Model – Transparency of RPC – RPC Messages.

Unit III **(15 Hours)**

Distributed Shared Memory: Introduction – General Architecture – Design and Implementation Issues – Granularity – Structure of shared Memory Space – Consistency Models – Replacement Strategy – Trashing – Heterogenous DSM – Advantages od DSM.

Unit IV **(15 Hours)**

Synchronization: Introduction – Clock Synchronization – Event Ordering – Mutual Exclusion – Deadlock – Election Algorithms. **Resource Management** : Task Assignment Approach – Load Balancing Approach – Load Sharing Approach. **Process Manageme**nt : Process Migration – Threads.

Sub.Code : 22UCA4A4

Unit V   **(15 Hours)**

Distributed File System: Introduction – Features – File Models – File Accessing Models – File Sharing, File Caching Schemes – File Replication – Fault Tolerance**. Naming:** Features – Fundamental Terminologies and Concepts.
Security: Cryptography – Digital Signatures.

Text Book

1. Pradeep K.Sinha, " Distributed Operating Systems : Concepts and Design", Prentice Hall of

   India, 2006

Reference Books

1.   A.S. Tanenbaum, M. VanSteen, "Distributed Systems", Pearson Education.
2.   George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems Concepts and Design", Third Edition, Pearson Education.
3.   Mukesh Singhal, "Advanced Concepts in Operating Systems", McGraw-Hill Series in Computer Science.
4.   Ajay D. Kshemkalyani, Mukesh Singhal, "Distributed Computing: Principles, Algorithms, and Systems", Cambridge University Press

MAPPING

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

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

Programme code : 10	**C**	**Bachelor of Computer Applications**		
Title of the paper	**o**	**Skill Based subject 2 - Linux Programming Lab**		
Batch	**u**	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	**r C**	**2**	**30**	**1**

Course Objectives

1. To gain knowledge about the usage of shell scripting.

2. To teach the concepts of using arithmetic operations and looping.

3. To impart knowledge about the creation of files and directories.

Course Outcomes (CO)

K3 to K5	CO1	Applying the concepts of control structures in programming.
	CO2	Implementing the concepts of file operations in programming
	CO3	Analyzing the concept of dialog utilities in shell programming.
	C04	Develop solutions for mathematical concept and propose appropriate result.
	C05	Evaluate the programming techniques and tools to design computer programs.

LIST OF PRACTICAL PROGRAMS

1. Write a shell program to display your address.

2. To perform arithmetic operations using shell arithmetic.

3. Print the different patterns using looping operations.

4. To perform simple inventory control operation using read statement.

5. To prepare the student mark statement using necessary controls.

6. Sort the given numbers in both ascending and descending orders.

7. Write a shell program to perform user defined function concept.

8. Write a shell program using dialog utility concept.

9. Write a program to perform file operation.

10. Write a shell script to print 'Hello Linux' message in Bold, Blink and different colors.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 50 Marks)

1. Record Work - 5 Marks
2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

Teaching Methods:

Smart Classroom, Projector, Discussion

Mapping

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

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

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Programme code : 10	Bachelor of Computer Applications		
Title of the paper	**Core Paper 6– Software Engineering**		
Batch 2022-2023	**Hours / Week 6**	**Total Hours 90**	**Credits 4**

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 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, Design, 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 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.

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

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

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

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

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

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MAPPING

PSO CO	PSO1	PSO 2	PSO 3	PSO 4	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

UGC 39

Programme code:10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 7 – Data Mining with R Programming		
Batch **2022-2023**	**Hours / Week** **6**	**Total Hours** **90**	**Credits** **5**

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 expose the student to learn the fundamental concepts of R Programming.

4. This course is to equip the students to visualize and analyses the data using R and to communicate statistical results in correct manner

Course Outcomes (CO)

	CO1	Knowing the data mining principles and techniques.
	CO2	Understanding the concept of raw data processing using data mining algorithms.
K1 to K5	CO3	Understand the basics in R programming in terms of constructs, control statements, string functions
	CO4	Create reports using R design and write efficient programs using R (and similar high-level languages) to perform routine and specialized data manipulation/management and analysis tasks
	CO5	Document analytical workflow using R, markdown languages, and version control

Syllabus

UNIT-I   (16 Hours)

Expanding Universe of Data- Production Factor-Data Mining-Data Mining versus Query Tools-**Data Mining In Marketing*** Getting started with data mining in R – Introduction to Functions – R Data Structures – Help Functions in R Learning – Vectors – Scalars – Declarations – Recycling – Common Vector Operations – Using all() and any() – Vectorized operations – NA and NULL values.

UNIT-II   (18 Hours)

Data preparation – Exploratory data analysis – Clustering– Data Mining and Text Mining Process– Data Visualization – Regression – Classification – Data Mining Necessary Steps. Cost Justification- Knowledge Discovery Process – Data Selection – Cleaning – Enrichment- Coding. – Vectorized if-then else – Testing Vector Equality – Vector Element names.

Unit III   **(18 Hours)**

Creating matrices – Matrix Operations – Applying Functions to Matrix Rows and Columns – Adding and deleting rows and columns - Vector/Matrix Distinction – Avoiding Dimension Reduction – Naming Matrix Rows and Columns – Higher Dimensional arrays – lists – Creating lists – General list operations – Accessing list components and values – applying functions to lists – recursive lists.

Unit IV   **(19 Hours)**

OLAP Tools – K –Nearest Neighbor –Decision Tree- Association Rule – Neural Networks – **Reporting*-** Different Forms of Knowledge- Ten Golden Rules– Creating Data Frames – Matrix-like operations in frames – merging Data frames – Applying functions to Data Frames – **Factors and Tables** : Factors and levels – Common Functions used with factors – Working with tables – Matrix/Array-Like Operations on Tables – Other factors and table related functions.

Unit V   **(19 Hours)**

Control statements – Arithmetic and Boolean operators and values – Default Values for arguments – Return Values – Functions are objects – Recursion – Replacement functions – Tools for Composing function code ***Math and Simulation in R** S3 Classes – S4 Classes – Managing your objects – Input/output – accessing keyboard and monitor – reading and writing files – String Manipulation – Graphics – Creating Graphs – Customizing Graphs – Saving Graphs to files.

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

Text Books

1.   Norman Matloff, (2011) "The Art of R Programming: A Tour of Statistical Software Design", No Starch Press.

2.   Pieter Adriaans, Dolf Zantinge,(2001), "Data Mining ", Addison Wesley,(

Reference Books

1.   Grolemund G, (2014) "Hands-on programming with R: write your own functions and simulations", O' Reilly Media Inc.

2.   James G., Witten D, Hastie T., &Tibshirani R,(2013) " An introduction to statistical learning: with Applications in R", Springer.

3.   Mark Gardner, (2013) "Beginning R – The Statistical Programming Language", Wiley.

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

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Web Reference

1.   https://www.geeksforgeeks.org/data-mining-in-r/

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/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

UGC 42

Programme code : 10	Bachelor of Computer Applications		
Title of the paper	Core Paper 8-Artificial Intelligence and Expert Systems		
Batch 2022-2023	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To learn the concepts of Artificial Intelligence.
2. Create awareness of informed search and exploration methods.
3. To demonstrate AI techniques for knowledge representation, planning and uncertainty management.

Course Outcomes (CO)

	CO1	Understand the concept of AI
K1 to K5	CO2	Analyze and evaluate informed search and exploration methods.
	CO3	Apply AI techniques for knowledge representation, planning and uncertainty Management.
	CO4	Analyze and develop knowledge of decision making and learning methods for real time application
	CO5	Explore how AI is already being used and evaluate problem areas of AI

Syllabus

UNIT I   **(17 Hours)**

INTELLIGENT AGENTS AND SEARCHING METHODS

Definitions of AI - Intelligent Agents**:** Agents and environments - Good behavior – The nature of environments – structure of agents. Informed search and exploration**:** Informed search strategies – heuristic functions – local search algorithms.

UNIT II   **(18 Hours)**

LOGIC

Logical agents: Knowledge-based agents – The Wumpus world. Logic – Propositional logic: A very simple logic. First order logic: Representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic. Inference in First order logic: propositional versus first order logic –forward chaining – backward chaining.

UNIT III   **(18 Hours)**

PLANNING AND UNCERTAINTY

Planning: The planning problem- planning with state-space search-partial order planning –graphs. Uncertainty: Overview of probability concepts, Representing knowledge in an Uncertain Domain, Semantics of Bayesian Networks, Exact Inference in Bayesian Networks

UNIT IV   **(18 Hours)**

DECISION MAKING AND LEARNING

Making Simple Decisions: The basis of Utility theory – Utility and multi-attribute utility functions – decision networks – The value of information – Decision theoretic expert systems**.** Learning from Observations: **Forms of learning*** - Inductive learning - Learning decision trees. Knowledge in Learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming.

UNIT V   **(19 Hours)**

LEARNING AND COMMUNICATION

Statistical Learning Methods: Introduction to neural networks, Perceptron's, Multi-layer feed forward network, Application of ANN. Reinforcement Learning: Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning. Communication: Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation.

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

Text Book
1. Stuart Russell, Peter Norvig, (2009) "Artificial Intelligence – A Modern Approach", Third Edition, Pearson Education / Prentice Hall of India.

Reference Books
1. Elaine Rich, Kevin Knight, Shivashankar.B.Nair, (2009), "Artificial Intelligence", Tata Mc GrawHill 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.

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MAPPING

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

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

Programme code:10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 5 - Data Mining with R Programming Lab		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 3

Course Objectives

1. Perform analytics using R programming.

2. Manipulate data within R and to create simple graphs and charts used in introductory statistics

3. Perform and interpret different distribution using R

4. Use R Graphics and Tables to visualize results of various statistical operations on data

Course Outcomes (CO)

K3 to K5	CO1	Understand the basics in R programming in terms of constructs, control statements, string functions
	CO2	To be able to understand the various data structures available in R programming language and apply them in solving computational problems.
	CO3	Understand the use of R for Big Data analytics.
	CO4	Extract data from files and other sources and perform various data manipulation tasks on them.
	CO5	Apply the R programming from a statistical perspective

Syllabus

1.Create a vector in R and perform operations on it.

2.Write a R program to find the area of rectangle, square and triangle by accepting suitable input from user.

3.Write code in R to manipulate text in R using grep(), toupper(), tolower() and substr() functions.

4.Create a function in R to print squares of numbers in sequence.

5.Write a program to get Date and Time in different Formats in R Programming.

6.Write a program to find a maximum and minimum of a list of number.

7.Write a R program to count the number of even and odd numbers from array of N numbers.

8.Write a R program to join columns and rows in a data frame.

9.Create pie chart and bar chart using R.

10. Write a R program to find factorial of the given number using recursive function.

11. Write a R program to perform Operators on Factors

12. Write a R program to work with Graph.

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 / 50 Marks)

1. Record Work - 5 Marks
2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

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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	H	H	S	S

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

UGC 48

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 9 -Web Designing**		
Batch 2022-2023	**Hours / Week 5**	**Total Hours 75**	**Credits 5**

Course Objectives

1. To understand website development in a user-friendly manner.

2. To improve the visual design and content structuring.

3. To understand the concept of Bootstrap to develop their web development skill.

Course Outcomes (CO)

	CO1	Understanding the use of HTML tags.
	CO2	Acquiring knowledge of Cascading Style Sheet.
K1 to K5	CO3	Analyzing the concepts of JavaScript.
	CO4	Applying the knowledge to perform calculations using various operators and built-in functions.
	CO5	Evaluate the web application using HTML, CSS, JavaScript and Bootstrap.

Syllabus

UNIT I (15 Hours)

HTML:- Introduction- Core Elements and Attribute – Basic Text Formatting-Presentational Elements-Phrase Elements- Lists- Editing Text- Using Character Entities for Special Characters-Comments-Font Elements- Basic Links-Creating Links with the <a> Element-Adding Images to Website- Using Images as Links- Tables-Forms-Frames.

UNIT II (15 Hours)

Cascading Style Sheets: Introducing CSS-CSS Rules, Properties, Types of CSS –Controlling Fonts-Text Formatting-Selectors: Type, Class, ID, and Attribute Selectors. Lengths-Percentages, Introducing the Box Model. Links- Backgrounds-Positioning with CSS-Page Layout.

UNIT III (15 Hours)

Java Script: Learning JavaScript-How to add a script to your pages-The Document Object Model-Starting to Program with JavaScript- Variables-Operators-Conditional Statements-Looping. Java Script Arrays: Passing Arrays to Functions-Multiple Subscripted Arrays. Java Script Functions: Functions- Function Definition - Duration of Identifiers – **Scope Rules***

Java Script Functions: Functions- Function Definition - Duration of Identifiers – **Scope Rules***
Recursion – Java Script Global Functions. Events-Built-In Objects-Writing JavaScript. Working with
JavaScript : Form Validation-Image Rollovers.

UNIT IV   (15 Hours)

Bootstrap: What is Bootstrap? Bootstrap History-Why to use Bootstrap?- Where to get Bootstrap?-
Bootstrap Grid System: Basic structure of a Bootstrap Grid- Bootstrap Tables- Bootstrap Images
Bootstrap Buttons- Bootstrap Buttons Groups.

UNIT V   (15 Hours)

Bootstrap List Groups- Bootstrap Form Layouts – Form inputs- Input sizing- Bootstrap dropdowns-
Bootstrap collapse- Bootstrap Panels-Tooltip –Tabs and Pills- Scroll spy- **Bootstrap carousel plug-
in*.**

* **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.Jon Duckett (2000) – "Beginning Web Programming With HTML, XHTML AND CSS", –
  Second Edition, Wiley India Pvt Ltd (Unit-I, II, III)
2.Bootstrap 4 Quick Start: A Beginner's Guide to Building Responsive Layouts with Bootstrap (Unit-
  IV, V)

Reference Books
1.   Thomas A. Powell, "The Complete Reference HTML", – Second Edition Tata McGraw Hill
Publication.
2.   Chris Bates - "Web Programming Building Internet Applications", Second Edition, John
Wiley & Sons, Ltd.

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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	H	S	S	S	S

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

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Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 10 – Python Programming**		
Batch **2022-2023**	**Hours / Week** **6**	**Total Hours** **90**	**Credits** **5**

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.
6. To do input/output with files in Python.

Course Outcomes (CO)

K3 to K5	CO1	Develop algorithmic solutions to simple computational problems and Read, write, execute byhand 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 andsequence data.
	CO4	Represent compound data using Python lists, tuples, dictionaries.
	CO5	Read and write data from/to files in Python Programs.

Syllabus

Unit I   (16 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.

Unit II   (18 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   (19 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.

Sub.Code: 22UCA610

Unit IV   (19 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   (18 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**
Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Books
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 andupdated for Python 3.2", Network Theory Ltd.

Reference Books

1. John V Guttag, (2013) "Introduction to Computation and Programming Using Python'', Revisedand expanded Edition, MIT Press.
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, (2016) "Introduction to Programming inPython: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd.
3. Timothy A. Budd, (2015) "Exploring Python", Mc-Graw Hill Education (India) Private Ltd.
4. Kenneth A. Lambert, (2012) "Fundamentals of Python: First Programs", CENGAGE Learning.
5. Charles Dierbach, (2013) "Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition.
6. Paul Gries, Jennifer Campbell and Jason Montojo, (2013) "Practical Programming: An

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Introduction to Computer Science using Python 3", Second edition, Pragmatic Programmers, LLC.

MAPPING

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

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

UCA 54

Programme Code:10	Bachelor of Computer Applications		
Title of the paper:	**Core Practical 6- Web Designing Lab**		
Batch 2022-2023	**Hours / Week 6**	**Total Hours 90**	**Credits 3**

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 facilitate students to create a website using HTML and Bootstrap.

Course Outcomes (CO)

	CO1	Applying the HTML tags to design Web Pages.
K3 to K5	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. Design a web page for Computing Student Mark list using JavaScript.

5. Design a web page for an Advertising using Style Sheets.

6. Design a web page with the following components using JavaScript.

   a) Image b) Hyperlink c) Scroll Bar d) Animation.

7. Design a web page for Library system using HTML Tags.

8. Design a web page for Payroll Processing using Java Script.

9. Design a web page for Electricity Bill Preparation using JavaScript.

10. Creating a Table using Bootstrap.

Guidelines to the distribution of marks for practical Examinations:

Two questions will be given for each student (3 Hours / 50 Marks)

1. Record Work - 5 Marks
2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

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

Project Work and Viva-voce

Sub.Code: 22UCA6Z1

Programme Code:10	Bachelor of Computer Applications

Core Project – Project Work & Viva – Voce ***			
Batch 2022-2023	**Hours/Week** **4**	**Total Hours** **60**	**Credits** **5**

Course Objectives

1. To acquire the knowledge about selecting the task based on their course skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence by implementing the task in a real time project.

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**	**45**	**50**
		Regularity	**05**	
	ESE	**Project report ***	**35**	**50**
		Viva –Voce *	**15**	

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

Teaching Methods

Power Point Presentation/Project Demo

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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

UCA 58

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Skill Based Subject 3– Python Programming Lab		
Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 1

Course Objectives

1. To gain knowledge about the concepts of python programming.
2. To understand the concepts of Built-in functions and User-defined functions.
3. To develop programs using String functions.

Course Outcomes (CO)

K3 to K5	CO1	Apply different types of operators in programming.
	CO2	Implement the concepts of built-in functions in programming.
	CO3	Analyze the use control structures in programming.
	C04	Appling the searching algorithm in programming
	C05	Evaluate the functionality of an exception handling mechanism

LIST OF PRACTICAL PROGRAMS

1. Write a program to convert temperature in Celsius to Fahrenheit and Fahrenheit to Celsius.

2. Write a program to display all the prime numbers within an interval.

3. Write a program to multiply two matrices using nested loops.

4. Write a program to accept 5 subject marks and to calculate the total, average and grade of a student.

5. Write a program to generate an electricity bill.

6. Write a Program to perform linear search.

7. Write a Program to perform merge sort.

8. Write a Program to perform binary search.

9. Write a Program to find the maximum of a list of numbers.

10. Write a python program to demonstrate File Input and Output operations.

11. Write a program to demonstrate Exception Handling.

12. Write a program to demonstrate Classes and their Attributes.

UCA 59

Sub.Code: 22UCA6SM

Guidelines to the distribution of marks for practical Examinations:

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

1. Record Work - 5 Marks

2. Algorithm, Program, Typing and Execution   : 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

Teaching Methods

Smart Classroom , Projectors, Discussion

Mapping

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

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

UCA 60

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	Part – IV - Environmental Studies**		
Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 2

Course Objectives

1. 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

2. To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.

3. To shape students into good "Eco citizens" thereby catering to global environmental needs.

4. 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

5. 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 (CO)

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

K1 to K5	CO1	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
	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

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Syllabus

Unit I   **(6 Hours)**

Multidisciplinary Nature of Environment

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   **(6 Hours)**

Ecosystems

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   **(6 Hours)**

Biodiversity and its Conservation

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   **(6 Hours)**

Environmental Pollution

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   **(6 Hours)**

Social Issues and the Environment

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.

Teaching Methods

Smart Class Room / Powerpoint Presentation / Seminar / Quiz / Discussion / Flipped Class

Text Book

1. P.Arul, "**A Text Book of Environmental Studies**", Environmental Agency, No27,Nattarstreet, Velacherry main road, Velacherry, Chennai – 42, First Edition, Nov. 2004.

Reference Books

1. Purohit Shammi Agarwal, **"A Text Book of Environmental Sciences"**, Publisher Mrs. Saraswati Prohit, Student Edition, 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 (External only)

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

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

UCA 63

Programme Code : 10	Bachelor of Computer Applications

Title of the Paper	Value Education – Moral and Ethics**

Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 2

Course Objectives

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

Course Outcomes (CO)

K1 to 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 Analyze 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)**

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

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)**

Physical Fitness and Mental Harmony: Simplified Physical Exercise – Hand Exercises Leg Exercises – Neuro Muscular Breathing Exercises – Eye Exercises – Kabalabathi Maharasana A & B – Massage - Acupressure – Relaxation – Kayakalpa Yogam Life Force– Aim & Objectives - Principle – Methods. Introspection – Analysis of Thoughts Moralization of Desires - Neutralization of Anger – Eradication of Worries.

Unit V   **(8 Hours)**

Yoga and Meditation – The Asset of India: Yogasanam – Rules & Regulations – Surya Namaskar– Asanas –Sitting – Stanging – Prone - Supine - Pranayama – Naadi Sudhi –Ujjayi– Seethali – Sithkari - Benefits. Meditation – Thanduvasudhi - Agna – Shanthi – Thuriyam – Benefits.

Teaching Methods

Smart Class Room / Powerpoint Presentation / Seminar / Quiz / Discussion / Flipped Class

Text Book

1. **Value Based Education – Moral and Ethics** – compiled by **Kongunadu Arts and Science College** (Autonomous), 2nd Edition (2021).

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).

5. **Yoga Practices - 1 – The World Community Service Centre** – Vethathiri Publications, Sixth Edition (2017), Erode.

6. **Yoga Practices - 2 – The World Community Service Centre** – Vethathiri Publications – Eighth Edition(2017), Erode.

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MAPPING

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

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

Value Education – Moral & Ethics

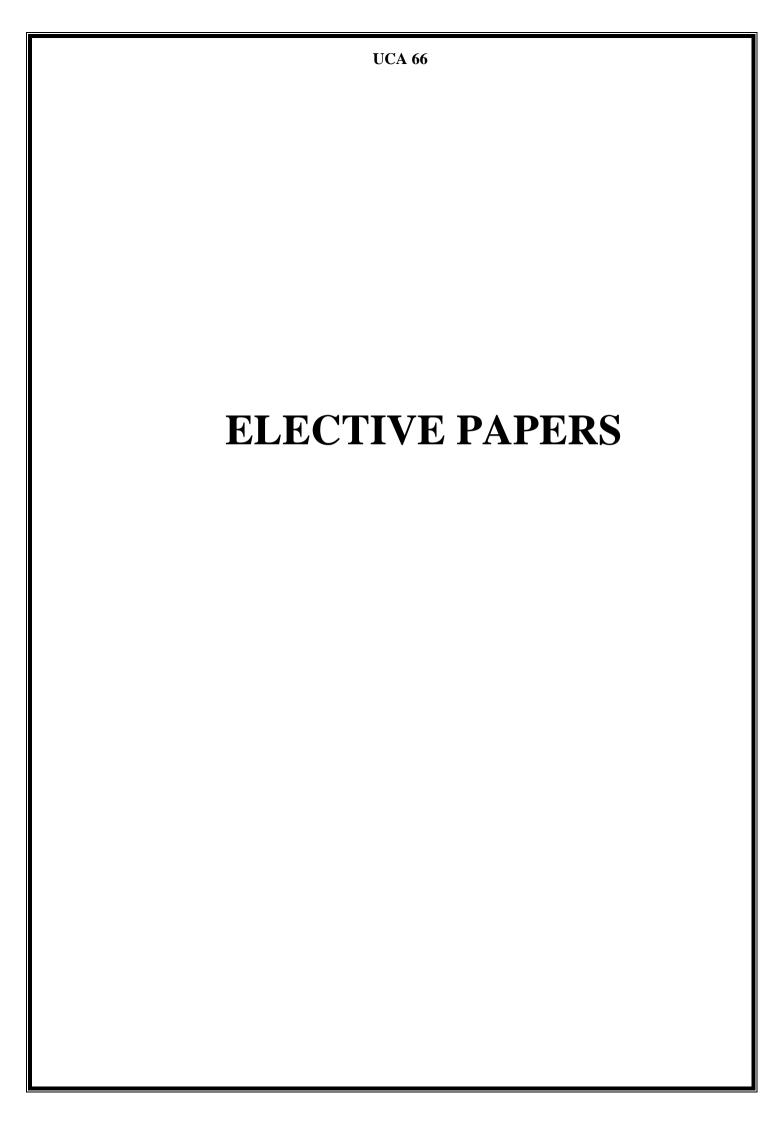### Question Paper Pattern
(**External only**)

Duration: 3 hours   Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

ELECTIVE PAPERS

UCA 67

ProgrammeCode:10	Bachelor of Computer Applications
Title of the Paper	**Major Elective – Multimedia Systems**

Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. Understand the definition of Multimedia
2. To study about the Image File Formats, Sounds Audio File Formats
3. Understand the concepts of Animation and Digital Video Containers
4. To study about the Stage of Multimedia Project
5. Understand the concept of Ownership of Content Created for Project Acquiring Talent

Course Outcomes (CO)

K1toK5	CO1	To Understand the Concepts of Cyber crime 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   **(15 Hours)**

Multimedia Definition-Use Of Multimedia-Delivering Multimedia- Text: About Fonts and Faces - Using Text in Multimedia -Computers and Text Font Editing and Design Tools –Hyper media and Hypertext.

UNIT II   **(15 Hours)**

Images: Plan Approach - Organize Tools - Configure Computer Workspace -Making Still Images - Color - Image File Formats. Sound: The Power of Sound -DigitalAudio-MidiAudio- Midivs.DigitalAudio-MultimediaSystemSounds Audio File Formats -Vaughan's Law of Multimedia Minimums - Adding   Sound to Multimedia Project

UNIT III   **(15 Hours)**

Animation: The Power of Motion-Principles of Animation-Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays-Digital Video Containers-Obtaining Video Clips -Shooting and Editing Video.

UNIT IV   **(15 Hours)**

Making Multimedia: The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs-

Software Needs - An Authoring Systems Needs-Multimedia Production Team

UNIT V   **(15 Hours)**

Planning and Costing: The Process of Making Multimedia-Scheduling-Estimating – RFPs and Bid Proposals. Designing and Producing - Content and Talent: Acquiring Content-Ownership of Content Created for Project – Acquiring Talent

Teaching Methods

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

Text Book
1.TayVaughan,"Multimedia:MakingItWork",8th Edition,Osborne/McGraw-Hill,2001.

Reference Books
1 .Ralf Steinmetz & Klara Nahrstedt "Multimedia Computing, Communication & Applications", Pearson Education, 2012.
2. Introduction to Multimedia Systems (Communications, Networking and Multimedia) 1st Edition by Sugata Mitra , Gaurav Bhatnagar
3.Handbook of Internet and Multimedia Systems and Applications: 6 (Internet and Communications) Hardcover – Import, 29 December 1998, by BorkoFurht

Web References
https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/
https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
https://mu.ac.in/wp-content/uploads/2021/04/Multimedia.pdf

MAPPING

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

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

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UCA 69

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Programme code: 10	Bachelor of Computer Applications		
Title of the Paper	**Major Elective – Internet of Things**		
Batch **2022-2023**	**Hours/Week** **5**	**Total Hours** **75**	**Credits** **5**

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Course Objectives

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

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Course Outcomes (CO)

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	CO1	Analyzing and evaluate the data received through sensors in IOT.
	CO2	Design and develop smart city in IoT
K1 to K4	CO3	Analyze various communication protocols for IoT.
	CO4	Analyze applications of IoT in real time scenario
	CO5	Evaluate appropriate protocol for communication between IoT.

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Syllabus

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UNIT I   **(15 Hours)**
Introduction to IoT-Genesis of IoT-IoT and Digitization-IoT Impact-Convergence of IT and OT-IoT Challenges- IoT Network Architecture and Design-Drivers Behind New Network Architectures-Comparing IoT Architectures- AdditionalIoT Reference Models.

UNIT II   **(15 Hours)**
The Core IoT Functional Stack- IoT Data Management and Compute Stack - Fog Computing-Edge Computing - The Hierarchy of Edge, Fog, and Cloud-Smart Objects- The Things in IoT-Sensors, Actuators, and Smart Objects- Sensor Networks-Wireless Sensor Networks-Communication Protocols for Wireless Sensor Networks

UNIT III   **(15 Hours)**
Connecting Smart Objects-Communications Criteria-IoT Access TechnologiesStandardization and Alliances- -Competitive Technologies- IEEE 802.15.4- IEEE 802.15.4g and 802.15.4e- IEEE 1901.2a-IEEE 802.11ah- LoRaWAN- NB-IoT and Other LTE Variations.

UNIT IV   **(15 Hours)**
IP as the IoT Network Layer- The Business Case for IP- Optimizing IP for IoT Authentication and Encryption on Constrained Nodes- ACE- DICE- Application Protocols for IoT- The Transport Layer-IoT Application Transport Methods- SCADA- Generic Web-Based Protocols- IoT Application Layer Protocols- CoAP.

UNIT V (15 Hours)
IoT in Industry*- Transportation*- Transportation Challenges- IoT Use Cases for Transportation-An IoT Architecture for Transportation- Extending the Roadways IoT Architecture to Bus Mass Transit- Extending Bus IoT Architecture to Railways- **Public Safety***- Public and Private Partnership for Public Safety IoT- An IoT Blueprint for Public Safety Emergency Response IoT Architecture-**School Bus Safety*- School Bus Safety Network Architecture*.**

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

Teaching Methods

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

Text Book

1.David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry (2017), IoT Fundamentals: Networking Technologies, Protocols and Use Cases for InternetofThings, 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.

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	H	S

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

UCA 71

Programme code: 10	Bachelor of Computer Applications		
Title of the Paper	Course Objectives Major Elective – Software Project Management		
Batch	Hours/Week	Total Hours	Credits
2022-2023	5	75	5

1. To Understand the fundamental principles of Software Project management

2. To know the different methods and techniques used for project management.

3. To perform Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.

Course Outcomes (CO)

K1	CO1	Understanding the fundamentals of Software Project Management, Phases & Models involved in developing the software.
K2	CO2	Obtaining Project Quality, SQA's Role and Risks.
K3	CO3	Analyzing the Requirements & Software Estimation.
K4	CO4	Maintaining the Software for later implementation.

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

Power Point Presentation , Assignment, Case Study, Seminar

Text Book

1. Gobalswamy Ramesh,(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

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

UCA 73

ProgrammeCode:10	Bachelor of Computer Applications
Title of the Paper	Major Elective – Fuzzy Logic

Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To understand the basic concept of Fuzzy logic
2. To learn the various operations on relation properties
3. To study about the membership functions
4. To learn about the Defuzzification and Fuzzy Rule-Based System
5. To learn the concepts of Applications of Fuzzy Logic

Course Outcomes (CO)

	CO1	Understand the basics of Fuzzy sets, operation and properties.
K1toK5	CO2	Apply Cartesian product and composition on Fuzzy relations and use the tolerance and Equivalence relations.
	CO3	Analyze various fuzzification methods and features of membership Functions.
	CO4	Evaluate defuzzification methods for real time applications.
	CO5	Design an application using Fuzzy logic and its Relations

Syllabus

UNIT I **(15 Hours)**

Introduction to Fuzzy Logic- Fuzzy Sets- Fuzzy Set Operations, Properties of Fuzzy Sets, Classical and Fuzzy Relations: Introduction-Cartesian Product of Relation.

UNIT II **(15 Hours)**

Operations on Crisp Relation-Properties of Crisp Relations-Composition Fuzzy Relations, Cardinality of Fuzzy Relations-Operations on Fuzzy Relations-Properties of Fuzzy Relations.

UNIT III **(15 Hours)**

Membership Functions: Introduction, Features of Membership Function, Classification of Fuzzy Sets, Fuzzification, Membership Value Assignments, Intuition, Inference, Rank Ordering.

UNIT IV **(15 Hours)**

Defuzzification: Introduction, Lambda Cuts for Fuzzy Sets, Lambda Cuts for Fuzzy Relations, Defuzzification Methods, Fuzzy Rule-Based System: Introduction, Formation of Rules, Decomposition of Rules.

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UNIT V   **(15 Hours)**

Applications of Fuzzy Logic: Fuzzy Logic in Automotive Applications, Fuzzy Antilock Brake System-

Antilock-Braking System and Vehicle Speed-Estimation Using Fuzzy Logic.

Teaching Methods

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

Text Book

S. N. Sivanandam, S. Sumathi and S. N. Deepa-Introduction to Fuzzy Logic using MATLAB,
Springer-Verlag Berlin Heidelberg 2007

ReferenceBooks

1. Guanrong Chen and Trung Tat Pham- Introduction to Fuzzy Sets, Fuzzy Logic and Fuzzy
   Control   Systems
2. Timothy J Ross , Fuzzy Logic with Engineering Applications

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Mapping

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

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

UCA 75

Programme Code:10	Bachelor of Computer Applications		

Title of the paper:	Major Elective:	Information Security	

Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To enable the students to learn fundamental concepts of Computer Security.
2. To provide an understanding of principal concepts, technologies and basic approaches in information security.
3. To understand the concepts of security policies such as authentication, integrity and confidentiality.

Course Outcomes (CO)

	CO1	Studying the basic concepts of security.
	CO2	Understanding the issues and technologies in information security.
K1 to K5	CO3	Learning various protection mechanisms.
	CO4	Analyzing tools and technology for combating threats to information assets.
	CO5	Evaluate the usage of Legal and Ethical Issues in Computer Security.

Syllabus

UNIT I   (**15 Hours**)

Is there Security Problem in Computing? : What does Security mean? –Attacks-The Meaning of Computer Security-Computer Criminals. **Protection in general purpose operating systems**: Memory and Address Protection -File Protection Mechanisms-User Authentication.

UNIT II   (**15 Hours**)

Program Security: Nonmalicious Program Errors – Viruses and other Malicious Code**:** Kinds of Malicious code, how viruses attach, Home for virus, Virus Signature, Example of malicious codes: Brain Virus, Worm, Code red, Web bugs.

Targeted Malicious Code: Trojans, Trap door, Salami attack, Keystroke Logging, Timing attacks-Controls against Program Threats: Developmental controls.

UNIT III   (**15 Hours**)

Database and Data Mining Security: Introduction to Databases*- Security Requirements- Reliability and Integrity- Multilevel Databases – Proposals for Multilevel Security: Separation- Data Mining.

UNIT IV   (**15 Hours**)

Security in Networks: Network Concepts-Threats in Networks: Categories of Attack, Who attacks networks? Reconnaissance, Pinging, Threats in transit: Eavesdropping and wiretapping, software based packet sniffing, tools, Microwave-Firewalls-Intrusion Detection Systems.

UNIT V   (**15 Hours**)

Legal and Ethical Issues in Computer Security: Protecting Programs and Data*- Information and the Law-Computer Crime: Why computer crime is hard to prosecute, Examples of Statutes, Cyber pornography, Accessing protected system, tampering with source code, Cryptography and the law- Case studies of Ethics: privacy rights, Fraud, Ownership of programs.

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

Teaching Methods

PowerPoint Presentation, Assignments, Discussions.

Text Book
 1. Charles P.Pfleeger, Shari Lawrence Pfleeger, Deven N.Shan, **"Security in Computing",** Fourth Edition.
 Reference Books

1. Dhiren R.Patel, (2008), **"**Information Security Theory and Practice**"**, PHI publications.

2. Ross J.Anderson and Ross Anderson, (2001), **"**security Engineering: A Guide to Building Dependable Distributed Systems", Wiley.

3. Debby Russell and Sr.G.T.Gangemi, (2006),"Computer Security Basics (paperback)", Second Edition, O'Reilley Media.

4. Thomas R.Peltier.Juystin Peltier and John Blackley, (2010),"Information Security Fundamentals",Second Edition, Prentice Hall.

UCA 77

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	S	S	S	S	S

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

UCA 78

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper : Major Elective - Block Chain Technology			
Batch	Hours / Week	Total Hours	Credits
2023-2026	**5**	**75**	**5**

Course Objectives

1. To introduce the technical aspects of public distributed ledgers, block

chain systems,

Crypto currencies and smart contracts.

2. Students will learn how these systems are built, how to interact with

them, how to design and build secure distributed applications.

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 technologies, 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 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, Namecoin.

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

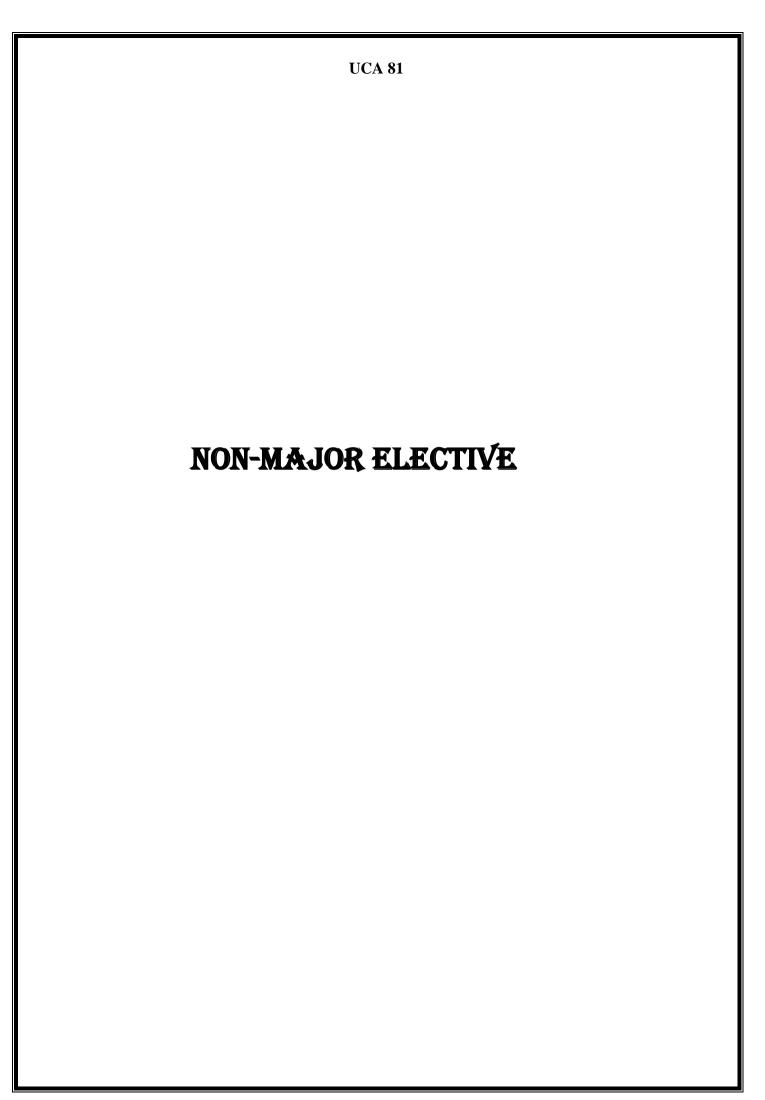| Smart classroom / PowerPoint presentation / Seminar / Quiz / Discussion/ Flipped Class |
| --- |

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).

REFERENCE BOOKS

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.

UCA 80

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

NON-MAJOR ELECTIVE

UCA 82

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	**Part IV - Non-major elective 1- Human Rights****		
Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 2

Course Objectives

1. To prepare for responsible citizenship with awareness of the relationship between HumanRights, 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 (CO)

	CO1	To understand the hidden truth of Human Rights by studying various theories
K1toK5	CO2	To acquire overall knowledge regarding Human Rights given by United Nation Commission (UNO).
	CO3	To gain knowledge about various organs responsible for Human Rights such as National Human Rights Commission and State Human Right Commission (UNHCR).
	CO4	To get habits of how to treat aged person, others and positive social responsibilities.
	CO5	To treat and confirm, child, refugees and minorities with positive social justice.

UNIT – I **(6 Hours)**

Definition, Meaning, Concept ,Theories and Kinds of Human Rights- Evaluation and Protection of Human Rights in India- Development of Human Rights under the United Nations.

UNIT – II **(6 Hours)**

United Nations Charter and Human Rights - U.N.Commission on Human Rights- Universal Declaration of Human Rights - International Covenant on

- Civil & Political Rights
- Economic, Social and Cultural Rights

UNIT – III **(6 Hours)**

Human Rights and Fundamental Rights (Constitution) - Enactments regarding Human Rights Laws in India - National Human Rights Commission and State Human Rights Commission.

UNIT – IV **(6 Hours)**

Aged persons and their Human Rights - Human Rights of Persons with Disabilities - Tribal Human Rights in India - Three Generation Human Rights -Social Awareness and Responsibilities of Individuals.

UNIT – V **(6 Hours)**

Rights of Women, Child, Refugees and Minorities –Social media and Human Rights -NGO's in protection of Human Rights - Right to Election.

Text Book
1**.** Human Rights (2019), Compiled by Kongunadu Arts and Science College,Coimbatore –29.

Reference Book:
1.Human Rights, (2018) Jaganathan,MA.,MBA.,MMM.,ML.,ML.,   Humanitarian Law andJ.P.Arjun Proprietor,Usha Jaganathan   Refugee Law   law series, 1st floor, Narmatha Nanthi Street, Magathma Gandhi Nagar, Madurai – 625014.

NON-MAJOR ELECTIVES I – HUMAN RIGHTS

QUESTION PAPER PATTERN
(External only)

Duration: 3 Hours **Max. Marks: 75**
Answer ALL Questions

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 84

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Part IV -Non- major elective 2 - Women's Rights**		
Batch 2022-2023	**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 (CO)

K1 to K5	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, India Laws for Protection of Women.
	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 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.

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 / Powerpoint Presentation / Seminar / Quiz / Discussion / Flipped Class

Text Book

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

Reference Books

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.

UCA 86

NON-MAJOR ELECTIVES I – WOMEN'S RIGHTS
                                                          22UWR4N2

Question Paper Pattern
(External only)

Duration: 3 hrs   Max: 75 marks

Answer <u>ALL</u> Questions

Section A (5x5=25)

Short notes – Either – Or/ Type - Question from each unit

Section B (5X10=50)

Essay type - Either – Or/ Type - Question from each unit

UCA 87

Programme Code : 10	Bachelor of Computer Applications
Part IV-Non- major elective 3 – Consumer Affairs	

Batch 2022-2023	Hours/Week 2	Total Hours 30	Credits 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 (CO)

K1 to 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	Analyse to handle the business firms' interface with consumers.
	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

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 Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA with important case law.

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

UCA 89

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.dRajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company

Girimaji, Pushpa (2002). Consumer Right for Everyone Penguin Books.

E-books :-www.consumereducation.in

Empowering Consumers e-book,www.consumeraffairs.nic.in

ebook,www.bis.org

The Consumer Protection Act, 2086 and its later versions.

UCA 90

Question paper pattern (External Only)

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.

Duration: 3 hrs   Max: 75 Marks

UCA 91

Programme Code:10	Bachelor of Computer Applications
Title of the Paper	Extra Departmental Course – Internet and Office Automation Lab

Batch 2022-2023	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To gain knowledge about the concepts of Internet

2. To understand the concepts of MS-Word, MS-Excel

3. To develop database using MS-Access and presentation using MS-PowerPoint

Course Outcomes (CO)

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-Power Point
	CO5	Applying the database components to develop table using MS-Access

LIST OF PRACTICAL

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 mark sheet using MS-Excel.

8. Create a slide show 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 (3 Hours / 50 Marks)

1. Record Work - 5 Marks

2. Algorithm, Program, Typing and Execution: 45 Marks.

Particulars	Program I (Marks)	Program II (Marks)
Algorithm	5	5
Program Writing	15	10
Typing and Execution	5	5

Teaching Methods

Smart Classroom, Projector, Discussion

Mapping

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

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

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 2023-2024)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	CIA	ESE	TOTAL	Duration of Exam (hours)	Credits
I	I	23TML1A1	Language I@	6	25	75	100	3	3
	II	23ENG101	English -I	6	25	75	100	3	3
	III	23UCA101	Core Paper 1 - C Programming	5	25	75	100	3	4
	III	23UCA1CL	Core Practical 1 - C Programming Lab	5	40	60	100	3	3
	III	23UCA1A1	Allied Paper 1 – Business Accounting	6	25	75	100	3	5
	IV	23EVS101	Environmental Studies **	2	-	50	50	3	2
			Total	**30**	**-**	**-**	**550**	**-**	**20**
II	I	23TML2A2	Language II@	6	25	75	100	3	3
	II	23ENG202	English –II	4	25	25	50 @@	3	1
	II	23UGN2NM	Effective English: Language Proficiency for Employability http://kb.naanmudhalvan.in/Special:Filepath/Cambridge_Course_Details.pdf	2	25	25	50 ##		2
	III	23UCA202	Core Paper 2 - Object Oriented Programming with C++	5	25	75	100	3	4
	III	23UCA2CM	Core Practical 2- Object Oriented Programming with C++ Lab	5	40	60	100	3	3
	III	23UCA2A2	Allied Paper 2 – Mathematics I	6	25	75	100	3	5
	IV	23VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
			Total	**30**	**-**	**-**	**550**	**-**	**20**
III	I	23TML3A3	Language III@	6	25	75	100	3	3
	II	23ENG303	English –III	6	25	75	100	3	3
	III	23UCA303	Core Paper 3 - Data Structures with Java Programming	4	25	75	100	3	5
	III	23UCA3CN	Core Practical 3 - Data Structures with Java Programming Lab	4	40	60	100	3	4
	III	23UCA3A3	Allied Paper 3 – Mathematics II	6	25	75	100	3	5
	IV	23UGC3S1	Skill Based subject 1- Cyber Security	2	100	-	100	3	3
	IV	23TBT301/ 23TAT301/ 23UHR3N1	Basic Tamil* / Advanced Tamil**/ Non-major elective- I**	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**25**

	I	23TML4A4	Language IV@	6	25	75	100	3	3
	II	23ENG404	English –IV	6	25	75	100	3	3
	III	23UCA404	Core Paper 4 -.net Framework with Oracle	4	25	75	100	3	4
	III	23UCA4CO	Core Practical 4 - .net Framework with Oracle Lab	4	40	60	100	3	3
	III	23UCA4A4	Allied Paper 4 – Distributed Operating System	5	25	75	100	3	5
IV	IV	23UCA4SL	Skill Based subject 2- Linux Lab	2	25	25	50 @@	3	1
	IV	23UCA4NM ###	Office Fundamentals: Digital Skills for Employability http://kb.naanmudhalvan.in/Special:Filepath/Microsoft_Course_Details.xlsx	1	25	25	50 ##	-	2
	IV	23TBT402/ 23TAT402/ 23USG4N2	Basic Tamil* / Advanced Tamil**/ Non-major elective- II**	2	-	75	75	3	2
			Total	30	-	-	675	-	23
	III	23UCA505	Core Paper 5 - Software Engineering	6	25	75	100	3	4
	III	23UCA506	Core Paper 6 - Data Mining with R Programming	6	25	75	100	3	4
	III	23UCA507	Core Paper 7 - Artificial Intelligence and Expert Systems	6	25	75	100	3	4
V	III	23UCA5CP	Core Practical 5 - Data Mining with R Programming Lab	5	40	60	100	3	3
	III	23UCA5E1	Major Elective 1 -	5	25	75	100	3	5
	IV	**-**	**EDC**	2	100	-	100	3	3
	-	**23UCA5IT**	**Internship Training ******			Grade			
			Total	30	-	-	600	-	23
	III	23UCA608	Core Paper 8 - Web Designing	5	25	75	100	3	4
	III	23UCA609	Core Paper 9 – Python Programming	5	25	75	100	3	4
	III	23UCA610	Core Paper 10 – Data Science	5	25	75	100	3	4
	III	23UCA6CQ	Core Practical 6 - Web Designing Lab	6	40	60	100	3	3
VI	III	23UCA6E2	Major Elective 2 -	5	25	75	100	3	5
	III	23UCA6Z1	Project***	-	20	80	100	-	5
	IV	23UCA6SM	Skill Based subject 3- Python Programming Lab	2	25	25	50 @@	3	1
	IV	23UCA6NM ###	Project Based Learning: Advanced Platform Technology / Data Analytics & Visualization http://kb.naanmudhalvan.in/images/3/3d/IBM_PBL.pdf	2	25	25	50 ##		2
			Total	30	-	-	700	-	28
	V	23NCC $/NSS/YRC /PYE/ECC/RRC/ WEC101#	Cocurricular Activities*	-	50	-	50	-	1
		Grand Total		-	-	-	3800	-	140

Note :

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

@@ End semester examination will be conducted for 50 marks and the marks will be converted to 25 marks.

Naan Mudhalvan Course: End of semester will be assessed by Industry for 25 marks and CIA will be done by the course teacher

The course can be opted to suit the skill set requirement of the core domain from the courses provided by the Bharathiar University and the same may be intimated to the COE during the beginning of that particular semester.

$ 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 – 23HIN/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

**** 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. Internet of Things
2. Multimedia System
3. Software Project Management
4. Block Chain
5. Information Security
6. Fuzzy logic

Non-Major Elective Papers

1. Human Rights
2. Consumer Affairs
3. SOGIESC Studies

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

23UCA5XL - 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)

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.

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 and EDC paper.
➢ The students to complete any **MOOC On learning platforms like SWAYAM, NPTEL, Course era, IIT Bombay Spoken Tutorial etc.,** 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.
➢ An **Onsite Training** preferably relevant to the course may be undertaken as per the discretion of the HOD.

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75+75)	
CIA II	75	Converted to 15	
Assignment/Seminar		5	25
Attendance		5	
Theory			
CIA I	75	(50+50)	
CIA II	75	Converted to 15	
Assignment/Seminar		5	25
Attendance		5	
Theory (Allied)			
CIA I	55	(55+55)	
CIA II	55	Converted to 10	
Assignment/Seminar		5	20
Attendance		5	
Practical			
CIA Practical		25	
Observation Notebook		10	40
Attendance		5	
Practical			
CIA Practical		10	
Observation Notebook		10	25
Attendance		5	
Practical (Allied)			
CIA Practical		10	
Observation Notebook		5	20
Attendance		5	
Project/Case study			
Review		15	20
Regularity		5	

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

1.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	
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	75
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

(ii) CIA I & II and ESE: 35 Marks (Allied)

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

(iii) CIA I & II and ESE: 50 Marks

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	
K1 – K5 Q11 to 15	B (Either or pattern)	5 x 3 = 15	Short Answers	50**
K2 – K5 Q16 to 20	C (Either or pattern)	5 x 5 = 25	Descriptive / Detailed	

**For ESE 50 marks converted to 25 marks.

2. ESE Practical Examination:

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

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

Knowledge Level	Section	Marks	Total
K3	Experiments	20	
K4	Record Work	05	25
K5			

3. ESE Project Viva Voce:

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 1 – C Programming**		
Batch **2023-2026**	**Hours / Week** **5**	**Total Hours** **75**	**Credits** **4**

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 impart adequate knowledge of programming languages and problem-solving techniques.

Course Outcomes (CO)

	CO1	Developing programs using the control statements, Arrays and Strings.
K1 to K5	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 – 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 FunctionArguments- Functions returning pointers. The Preprocessor: 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 Operationson Files – Command Line Arguments.

* 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, (2008), **"Programming in ANSI C",** Eighth Edition -Tata McGraw Hill
Reference Books
   1. Ashok N Kamthane, (2007), **"Programming with ANSI and Turbo C",** Pearson Education Publication.

   2. P.J.Deitel and 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

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 1 - C Programming Lab		
Batch 2023-2026	Hours / Week 5	Total Hours 75	Credits 3

Course Objectives

1. To introduce C Programming concepts to develop the programming knowledge.

2. To enhance their analyzing 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.

Course Outcomes (CO)

K3 to K5	CO1	Learning process helps in deep understanding the concepts of C language.
	CO2	Applying the various basic programming constructs like decision making statements, looping statements, functions, structures, pointers etc.,
	CO3	Developing programs using control statements, Arrays and Strings.
	CO4	Enabling effective usage of arrays, structures, functions and pointers.
	CO5	Implementing the files and command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a program to find the median for a given set of numbers.

2. Write a program to find the Standard Deviation for a given set of numbers.

3. Write a program to find the number of palindrome strings in a given sentence.

4. Write a program to generate N Prime and Armstrong numbers.

5. Write a program to perform Matrix addition & Multiplication using Arrays.

6. Write a program to calculate NCR using the formula NCR = N! / (R! * (N-R)!) Using functions.

7. Write a program to print Fibonacci Series using Recursive Function.

8. Write a 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 program to perform string manipulation operations.

10. Write a program to perform all manipulations like insertion, deletion and modification in files for student mark list.

11. 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

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

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 2 – Object Oriented Programming with C++**		
Batch 2023-2026	**Hours / Week 5**	**Total Hours 75**	**Credits 4**

Course Objectives

1. To perform object- oriented programming to develop solutions to problems demonstrating usage of control structures, modularity, I/O and other standard language constructs.

2. To develop an in-depth understanding of functional, logic, and object-oriented programming paradigms.

3. To program using more advanced OOP's features such as objects, operator overloading, dynamic memory allocation, inheritance and polymorphism, File I/O.

Course Outcomes (CO)

K1 to K5	CO1	Understanding the features of C++ Programming.
	CO2	Understanding the advanced features of C++ specifically, Operator Overloading, Templates, Streams.
	CO3	Applying the major object-oriented concepts to implement programs, Inheritance and Polymorphism
	CO4	Implementing different Operations on Functions, Classes & Object, and Constructors.
	CO5	Evaluate the usage of object oriented programming in terms of software reuse and managing complexity to solve real-world problems.

Syllabus

UNIT I   **(15 Hours)**

Procedure Oriented Programming – Basic Concepts of Object-Oriented Programming -Beginning with C++ - Expression & Control Structure: Data Types – Reference Variables – Operators in C++ - Scope Resolution Operator – Type Cast Operator – Branching & Looping.

UNIT II   **(15 Hours)**

Functions: Function Prototypes – Call by Reference – Return by Reference – Inline Functions – **Default & Const Argument *-** Function Overloading – Friend Functions.

UNIT III   **(15 Hours)**

Classes & Objects – Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default arguments – Copy Constructors – Destructors.

UNIT IV   **(15 Hours)**

Operator Overloading – Inheritance: Defining derived class – Types of inheritance – Virtual Base Class. Pointers: This pointer – Pointers to Objects – Virtual functions & Polymorphism – Templates.

UNIT V   **(15 Hours)**

Working with Files: Classes for file stream operation - Opening and closing a file – File pointers and their manipulations – Command Line Arguments.

* **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 Book
  1.   E.Balagurusamy, (2020), "Object Oriented Programming with C++", Eighth Edition -
       Mc Graw Hill Publications.

Reference Books

  1. Ashok N. Kamthane, (2003) **-** "Object oriented Programming with ANSI and
     Turbo C++", FirstEdition - Pearson Education Publication.
  2. Yashavanth Kanetkar, (2008), "Let us C++", Fourth Edition - BPB Publications.

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	S	S

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

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 2 – Object Oriented Programming with C++ Lab		
Batch 2023-2026	Hours / Week 5	Total Hours 75	Credits 3

Course Objectives

1. To develop programming skills using object - oriented concepts.

2. To develop the ability to write a program to solve specific problems.

3. To practice the fundamental methodology to implement file and I/O stream concepts.

Course Outcomes (CO)

K3 to K5	CO1	Apply the various basic programming constructs like decision making statements, Looping statements, functions, concepts like overloading, inheritance, polymorphism, virtual functions, constructors and destructors.
	CO2	Designing programs using appropriate predefined functions and classes in C++.
	CO3	Developing applications using Friend functions, Inheritance and polymorphism.
	CO4	Developing a C++ application using the concepts of Templates, stream I/O, Files and usage of the available classes to handle stream objects.
	CO5	Evaluate the implementation of command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Develop a C++ Program to implement the concept of classes and objects.

2. Write a C++ Program to implement the types of Functions.

3. Develop a C++ Program to implement the concept of Function overloading.

4. Construct a C++ program to implement the concept of Constructors.

5. Develop a C++ Program to implement the concept of Operator overloading.

6. Develop a C++ Program to implement the concept of Inheritance.

7. Construct a C++ Program to implement the concept of Polymorphism using Virtual Functions.

8. Write a C++ program to swap two numbers using the concept of Function Templates.

9. Write a C++ program to perform White Space Suppression in a file.

10. Write a program that performs file copy using command line arguments.

Teaching Methods

| Smart Classroom, Projectors, |

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

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Particulars	Program I (Marks)	Program II (Marks)
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CO2	S	H	S	M	M
CO3	H	S	H	S	S
CO4	H	M	H	H	H
CO5	S	H	H	S	S

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