KONGUNADU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
COIMBATORE – 641 029

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2021 - 2022 onwards)

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 contribute to the economic development of the region, state and nation.

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

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

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

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

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

PROGRAMME SPECIFIC OUTCOME (PSO)

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

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

PSO3 An ability to apply design and development principles in the construction of softwaresystems 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 :-Computer Applications

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	Exam. Marks			Duration of Exam (hours)	Credits
					CIA	ESE	TOTAL		
I	I	21TML1A1	Language I @ Tamil I/Hindi I /French I/Malayalam I/ Sanskrit I	6	50	50	100	3	3
	II	21ENG101	Language - 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**	**-**	**-**		**-**	
II	I	21TML2A2	Language II @ Tamil II/Hindi II/ French II/Malayalam II/Sanskrit II	6	50	50	100	3	3
	II	21ENG202	Language -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
	III	21UCA2CM	Core Practical 2 – Object Oriented Programming with C++ Lab	3	50	50	100	3	2
	IV	21UCA2A2	Allied Paper 2 – Computer Oriented Numerical and Statistical methods	2	50	50	50	3	2
			Total	**30**	**-**	**-**		**-**	
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	2	3
	IV	21TBT301/ 21TAT301/ 21UHR3N1	Basic Tamil*/ Advanced Tamil **/ Non-major Elective 1 – Human Rights**	2		50	50	3	2
			Total	**30**	**-**	**-**		**-**	
	III	21UCA407	Core Paper 7 – Software Engineering	5	50	50	100	3	4

Sem	Part	Course Code	Title	Hours	CIA	ESE	Total		Credits
	III	21UCA408	Core Paper 8 – Computer Networks	5	50	50	100	3	4
IV	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 Communicative Skills	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 2 –Women's Rights**	2		50	50	3	2
			Total	30	-	-		-	
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	21UCA5E1	Major Elective I	6	50	50	100	3	5
	III	21UCA5CP	Core Practical 5 – Visual Programming Lab	5	50	50	100	3	2
	IV	21UCA5X1	**Extra Departmental Course**	2	50	50	100	3	3
	-	21UCA5IT	**Internship Training ******	Grade					
			Total	30	-	-		-	
VI	III	21UCA6E2	Major Elective II	6	50 50	50 50	100	3	5
	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		50	50	100	3	5
	III	21UCA6Z1	Project Work & Viva-Voce ***#	-	50	50	100	-	5
	IV	21UCA6S3	Skill Based Subject 3 Linux programming Lab	2	50	50	100	3	3
	-	-	**SWAYAM-MOOC**	-	-	-	-	-	2
			Total	30	-	-		-	
	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 - 202

* - 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 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. OpenSource Systems

3. Android Applications and Development

4. Big Data and Analytics

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) :

21UCA5X1 - 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	70
	-	SWAYAM-MOOC	-	2
	III	Allied	400	20
		Electives/Project	300	15
4.	IV	Basic Tamil / Advanced Tamil/ 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**

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

➤ The students should complete a **SWAYAM-MOOC** before the completion of the 5th semester and the course completed certificate should be submitted through the HOD to the Controller of Examinations. Two credits will be given to the candidates who have successfully completed. In case the students have completed more than one online course, the appropriate 2 extra credits shall be awarded to such candidates upon the submission of certificate through the HOD to the Controller of Examinations.

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

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	
Project			
Review		45	50
Regularity		5	

Components of Continuous Internal Assessment (30 Marks & 25 Marks)

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

* Class Participation, Case Studies Presentation, Field Work, Field Survey, Group Discussion, Term Paper, Workshop/ ConferenceParticipation. 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) <u>CIA I & II and ESE: 75 Marks</u>

Knowledge Level	Section	Marks	Description	Total
K1 – K2 Q1 to 20	A (Answer all)	20 x 1 = 20	MCQ-10/ Fill ups-5/ One word-5	75**
K2 – K5 Q21 to 28	B (5 out of 8)	5 x 5= 25	Short Answers	
K2 – K5 Q29 to 33	C (3 out of 5)	3 x 10 = 30	Descriptive / Detailed	

**For ESE 75 marks converted to 50 marks.

ii) <u>CIA I & II and ESE: 45 Marks</u>

Knowledge Level	Section	Marks	Description	Total
K1 – K2 Q1 to 10	A (Answer all)	10 x 0.5 = 5	MCQ	45
K2 – K5 Q11 to 15	B (either or type)	5 x 3 = 15	Short Answers	
K2 – K5 Q16 to 20	C (either or type)	5 x 5 = 25	Descriptive / Detailed	

ESE Practical Examination:

Option 1 :

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

ESE Project Viva Voce:

Option 1:

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

UCA1

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 1 – C Programming		
Batch	Hours / Week	Total Hours	Credits
2021-2022	5	75	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 Function Arguments- 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 Operations on Files – Command Line Arguments.

* denotes Self study

Teaching Methods

Smart classroom / Powerpoint presentation / Seminar / Quiz / Discussion

Text Books

1.   Balagurusamy ,(2008), **"Programming in ANSI C "** , Fourth Edition -Tata Mc Graw Hill

Reference Books

1. Ashok N Kamthane,(2002),**"Programming with Ansi and Turbo C",** Pearson Education Publication,.
2. Henry Mullish & Herbert L Cooper, (1996), **"The Spirit of C"**,Jaico Publication House.
3. P.J.Deitel and H.M.Deitel,(2008**),"C How to Program"** ,5th Edition, Tata McGraw Hill.
4. Yeswanth Kanethkar,(2007),**"Let Us C"**, Eigth Edition - BTB Publications.

UCA3

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 2021-2022	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.

UCA5

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, deletionand 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

UCA6

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 2021-2022	Hours / Week 4	Total Hours 60	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   **(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.

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.

UCA8

Sub.Code: 21UCA202

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.

* denotes Self study

Teaching Methods

Smart ClassRoom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Book:

1. E.Balagurusamy, (2008), "Object Oriented Programming with C++", Fourth Edition -
   Mc Graw Hill Publications.

Reference Books:

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

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

MAPPING

CO \ PSO	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

UCA9

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 3 – Digital Fundamentals and Computer Organization		
Batch	Hours / Week	Total Hours	Credits
2021-2022	3	45	4

Course Objectives

1. To learn the concept of Digital Circuits, Circuit Constructions and Simplifications of Boolean function
2. To know the concept of Multiplexers, Flip-Flops and Registers and to familiarize the Memory Hierarchy and Peripheral Devices.
3. To understand the concepts of different types of languages and Instruction Formats.

Course Outcomes (CO)

K1 to K5	CO1	Understanding the Number systems and conversions in Digital Computer System.
	CO2	Understanding the concepts of Boolean expressions, Logic Gates and to apply the methods to simplifying the Boolean expression.
	CO3	Applying the knowledge to perform arithmetical operations using various logical circuits.
	CO4	Designing and implementing various Synchronous and Asynchronous data transfer and peripheral devices.
	CO5	Evaluate the working nature of digital system design and sequential circuits.

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 – Addressing Modes.

UNIT II (10 Hours)

Binary Systems: Digital Computer and Digital Systems – Binary Numbers – Number Base Conversion – Octal and Hexadecimal Numbers – Complements – 1's , 2's , 9's, and 10's Complements. Binary Code's: BCD, GRAY, Excess 3 Codes.

UNIT III (10 Hours)

Boolean algebra And Logic Gates: Basic Definitions – Boolean Functions – Canonical and Standard Forms – Sum of Product – Product of Sum – Minterms and Maxterms.
Digital Logic Gates: Simplification of Boolean Functions: The Map Method – Two & Three Variable Maps – Four Variable Map – Don't Care Conditions.

UNIT IV   **(9 Hours)**

Combinational Logic: Introduction – Adders - Subtractors – Multiplexers – De-Multiplexers. Sequential Logic: Introduction – RS, D, JK Flip Flops.

UNIT V   **(8 Hours)**

Input – Output Organization: **Peripheral Devices** * – Asynchronous Data Transfer – Direct Memory Access – IOP. Memory Organization: Main Memory – Cache Memory –Virtual memory.

* denotes Self study

Teaching Methods:

Smart classroom/ Powerpoint Presentation / Seminar / Quiz / Discussion

Text Books:

1.   Thomas C Bartee , (2008) , **"Digital Computer Fundamentals"**, Tata Mc Graw Hill Publications, New Delhi , 6 th 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, III & IV).

3.   Morris Mano,(2011), "**Computer System Architecture" ,** Third Edition, Prentice Hall of India, New Delhi,(8th Impression) - (Units I & 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 ,Mc Graw Hill International.

UCA11

MAPPING

PSO / CO	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

UCA12

Programme Code: 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 2 – Object Oriented Programming With C++ Lab		
Batch	Hours / Week	Total Hours	Credits
2021-2022	3	45	2

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, Discussions

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

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

UCA14

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 4 – Operating Systems		
Batch	Hours / Week	Total Hours	Credits
2021-2022	5	75	4

Course Objectives

1. To understand the structures of modern computers.

2. To understand the purpose and usage of functions in operating systems.

3. To cover the details of concurrent processes, multi-threads, CPU scheduling, memory management file system, storage subsystem, and input/output management.

Course Outcomes (CO)

K1 to K5	CO1	Understanding of design issues, mastering in functions, structures and history of operating systems.
	CO2	Learning various Process Management Concepts including Scheduling, Synchronization, Multithreading and Deadlocks.
	CO3	Implementing the processes, resource control, physical and virtual memory, scheduling, I/O and files.
	CO4	Understanding about Resource Sharing among Users. Familiar with Protection and Security Mechanisms. Types of Operating Systems including Unix.
	CO5	Evaluate the functionality of memory allocation and its policies.

Syllabus

UNIT I   **(14 Hours)**

History of the operating Systems - Zeroth, first, Second, Third, Fourth Generation - Computer Architecture: 4GL, 3GL, 2GL, 1GL, OGL. Program, Interrupts - Operating System functions.

UNIT II   **(15 Hours)**

Memory Management - Introduction - Single Contiguous Memory Management - Fixed partition Memory Management Variable, partition - Non-contiguous Allocation - General concepts - Paging - Segmentation - Combined system.

UNIT III   **(16 Hours)**

Process Management - Evolution – Introduction – Evolution of Multi Programming – Context Switching-Process States-Process State Transition-Process Control Block-Process Hierarchy-Create-Kill Process-Dispatch Process-Change the Priority of a Process – Block a Process – Dispatch a Process-Time up a Process-Wake up a Process- Suspend/Resume Operations- Multi Tasking-Deadlocks-Introduction- Deadlock prerequisites.

UCA15

Sub.Code:21UCA304

UNIT IV **(16 Hours)**

Information Management And File Management - Introduction - The File System Block& Block Numbering Scheme –File Support Level -File Directory Entry- Open/Close Operations-Directory Structure -Device Driver-Basics-Path Management-I/O Procedure-I/O Scheduler.

UNIT V **(14 Hours)**

Case Studies - Unix - **History Of Unix *** – Overview Of Unix-Unix File System: Different types of files , Mounting/Unmounting file systems, Open, close, Read, write system calls, Create a file, Delete a file, Change directory- **Memory Management***.

* denotes Self study

Teaching Methods

Smart classroom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Books

1. Achyut S. Godbole, (2009), "Operating Systems", Second Edition -Tata McGraw Hill Publishing Company Limited, (reprint).

Reference Books

1. William Stallings,(2001), "Operating Systems", Second Edition- Prentice Hall of India Ltd.

2. H.M Deitel,(2003), "Operating Systems", 2nd Edition- Pearson Education, 2003.

3. Deitel, Choffnes,(2007), "Operating Systems", Third Edition-Pearson Education,.

UCA16

MAPPING

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

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

UCA17

Sub.Code: 21UCA305

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Core Paper 5 – Data Structures and Algorithms		
Batch	Hours / Week	Total Hours	Credits
2021-2022	5	75	4

Course Objectives

1. To represent the way of defining Data.

2. To explain the fundamental techniques for designing and analyzing algorithms.

3. To study various algorithms of Sorting, Searching methods in Data structures.

Course Outcomes (CO)

K1 to K5	CO1	Understanding data structures and the concepts of algorithms for dynamic programming.
	CO2	Applying the data structures algorithms for various applications.
	CO3	Demonstrating familiar data structure algorithms.
	CO4	Applying the computational complexity of various algorithms.
	CO5	Evaluate appropriate sorting/searching technique for given problem.

Syllabus

UNIT I (Hours 14)

Introduction - Overview - **How To Create Programs Analyze Them *.** Arrays - Structures - Ordered Lists- Representation of Arrays - Simple Applications.

UNIT II (Hours 15)

Stacks and Queues –Fundamentals-Structure s- Operations- Multiple Stacks and Queues- Applications and Evaluation of expressions.

UNIT III (Hours 16)

Linked Lists - Single Linked Lists- Linked Stacks And Queues - The Storage Pool - Applications - Polynomial Addition, Sparse Matrices. Double Linked Lists- Dynamic Storage Management -Garbage Collection And Compaction.

UCA18

UNIT IV **(Hours 16)**

Searching And Sorting: Binary, Sequential, And Fibonacci - Internal Sorting Insertion, Quick, Merge, Heap, Radix Sorts - External Sorting - Sorting With Disks - K-Way Merging- Sorting With Tapes - Balanced Merge - Polyphase Merge. Symbol Tables - Static Tree - Dynamic Tree - Hash Tables.

UNIT V **(Hours 14)**

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

* denotes Self Study

 Teaching Methods

Smart classroom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Book

1. Ellis Horowitz & Sartaj Sahani , (1999)- "Fundamentals of data structure", First Edition Galgothia book source,.

Reference Books

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

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

Programme Code : 10	Bachelor of Computer Applications		
Title of the paper	Core Paper 6 – Relational Database Management Systems		
Batch 2021-2022	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To develop the knowledge in various Database concepts, queries, normalization and reports..
2. To study the physical and logical database design and modeling.
3. To learn procedural interfaces using SQL queries.

Course Outcomes (CO)

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

Syllabus

UNIT I   **(14 Hours)**

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

*,DCL-Operators Aggregate functions.

UNIT II   **(15 Hours)**

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

UNIT III   **(16 Hours)**

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

UNIT IV   **(15 Hours)**

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

UNIT V   **(15 Hours)**

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

* denotes Self study

Teaching Methods

Smart classroom / Powerpoint Presentation / Seminar / Quiz / Discussion

Text Books:

1. Abraham Silberschatz , Henry F. Korth, S. Sudharshan,(2002),"Database System Concepts"**,** Fourth Edition -Tata McGraw Hill International Editions.

2. Ivan Bayross ,(2000), "Commercial Application Development using Oracle developer 2000", BPB publications.

Reference Books

1. David Loctman, (1997), "Developing Personal Oracle For Windows 95", Sams Publishing, 2nd Revised Edition.

2. Elmasri Navathe,(2001), "Fundamentals of Database Systems", First Edition- Pearson Education publication.

3. Sharad Maheshwari &   Ruchin Jain,(2006),"Database Management Systems" Complete Practical Approach", Second Edition

4. Nilesh Shah,(2007), "Database Systems using Oracle" A Simplified Guide to SQL & PL/SQL, Second Edition ,Prentice Hall of India Private Ltd, New Delhi,

5. Ivan Bayross,(1995),"Oracle 7 The Complete Reference",BPB Publications.

UCA21

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	H	S

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

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	Core Practical 3 – Relational Database Management Systems Lab		
Batch	Hours / Week	Total Hours	Credits
2021-2022	5	75	2

Course Objectives

1. To understand the use of Structured Query Language (SQL) and its syntax.

2. To understand and apply the principles of data modeling using Entity Relationship and develop a good database design.

3. To study the concepts and techniques relating query processing using SQL engines.

Course Outcomes (CO)

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

LIST OF PRACTICAL PROGRAMS

1. Creating Tables and writing simple queries using

   a) Comparison Operators

   b) Logical Operators

   c) Set Operators

   d) Sorting and Grouping

2. Creation of Reports using Column format

3. Writing Queries using built in functions.

4. Updating and altering tables using SQL.

5. Creation of Students Information table and write PL/SQL Block find the Total, Average marks and Results.

6. Design a PL/SQL block to prepare the Electricity Bill.

7. Programming with Cursors: Code a PL/SQL Block to partition the students Information Table into two, one with the Passed and other with Failed.

8. Implement the concepts of Joined relations to Database.

9. Create a Database Trigger to check the data validity of Record.

10. Recursive Functions Write a Recursive function to find

    a) Factorial of N

    b) Fibonacci Series with N terms.

11. Use SQL queries to manage Views, Sequences and Synonyms.

12. Create a Database Trigger to implement the Master - Detail Relationship.

13. Implement the concept of Stored Procedure with Parameters using SQL queries.

14. Implement the concept of Packages using Procedure and Function.

15. Design a PL/SQL program to handle User defined exception.

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	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	H

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

UCA24

Programme code : 10	Bachelor of computer applications		
Title of the paper	Core Paper 7 – Software Engineering		
Batch 2021-2022	Hours / Week 5	Total Hours 75	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   **(15 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   **(14 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   **(16 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   **(15 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   **(15 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.

*denotes Self study

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.

UCA26

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

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	**Core Paper 8 – Computer Networks**		
Batch	**Hours / Week**	**Total Hours**	**Credits**
2021-2022	**5**	**75**	**2**

Course Objectives

1. To deal with basic ideas of networking domain.

2. To present the principles of Cryptography in Computer Networks.

3. To know the classical, advanced encryption standards and techniques, message authentication codes, digital signatures, email.

Course Outcomes (CO)

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

Syllabus

UNIT I (13 Hours)

Introduction: Uses of computer networks: Business Applications-Home Applications-Mobile Users-Social Issues. Network Hardware: LAN-MAN-WAN-Wireless Networks-Internetworks – Network Software: Protocol Hierarchies-Design Issues for the Layers-Connection Oriented and Connectionless Services-Service Primitives-The Relationship of Services to Protocol – Reference Models.

UNIT II (15 Hours)

The Physical layer: Guided transmission media – Magnetic media-Twisted pair - Coaxial cable – Fiber Optics –Comparison of Fiber optics and Copper wire-The Public Switched telephone network: Structure of the telephone system – The local loop : modems- Switching.

UNIT III (16 Hours)

The Data link layer: Data link layer design Issues – Error Detection and Correction. The Medium access control sub layer: The channel allocation problem – Multiple access protocols: Carrier sense multiple access protocols – Collision-Free Proto cols- Bluetooth: Blue tooth Architecture, **Bluetooth Applications ***.Data link layer switching: repeaters, hubs, bridges, switches, routers and gateways.

UNIT IV   **(16 Hours)**

The Network layer: Network layer design issues – Routing algorithms: The optimality principle, shortest path routing- Congestion Control Algorithm: Congestion Control in Virtual Circuit Subnet, Datagram Subnet.

The Transport layer: The Transport service: Services provided to the upper layers– Elements of Transport protocols.

UNIT V   **(15 Hours)**

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

* denotes Self Study

 Teaching Methods:

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Books:

1. Andrew S. Tanenbaum, (2008),"**Computer Networks"**, Fourth Edition - Pearson Education
   Publication.

Reference Books:

1. Behrouz A. Forouzan,(2007), **"Data Communications and Network"**, Second Edition, Tata
MCGraw Hill.
2. William A Shay, (2001),**"Understanding data communications and Networks"** , Second
    Edition -Vikas Publication.

UCA29

MAPPING

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

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

UCA30

Programme code : 10	Bachelor of Computer Applications		
Title of the paper	Core Paper 9 – Advanced Java Programming		
Batch 2021-2022	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To enhance the knowledge of object-oriented programming using the Java programming language
2. To understand the applets, files, swings and exception handling mechanisms.
3. To illustrate the various features of java.

Course Outcomes (CO)

K1 to K5	CO1	Applying java programming language for various programming Applications.
	CO2	Acquiring knowledge of the structure and model of the java programming language
	CO3	Implementing Applets for GUI Concepts.
	CO4	Analyzing the concepts of Threads, Swings and Files.
	CO5	Evaluating applications using Swing Concepts.

Syllabus
UNIT I   **(13 Hours)**

JAVA Evolution: History – Features – How Java differs from C and C++ - Java and Internet- Java and WWW – Web Browsers. Overview of Java Language: Introduction – Simple Java program – Structure – Java Tokens * – Statements - Java Virtual Machine. Classes, Objects and Methods: Introduction- defining class- field declaration-method declaration- creating objects-Constructors- Method Overloading- Overriding Methods.

UNIT II   **(15 Hours)**

Arrays: One Dimensional Arrays- Creating an Array- Two dimensional Arrays, Strings and Vectors. Interfaces: Multiple Inheritance.

UNIT III   **(16 Hours)**

Packages: Putting classes together – Multi Threaded Programming. Managing Errors and Exceptions. Applet programming: Introduction-How applet differs from other applications- Applet Life cycle- Applet Tag. Graphics programming: Introduction- The Graphics Class-Lines and Rectangles-Circles and Ellipses- Drawing Arcs Using control Loops in Applets.

UNIT IV   **(16 Hours)**

Files: Introduction – concept of streams – Stream classes – Using streams – I/O classes- File class – Creation of files- Reading/Writing characters /Bytes-Handling Primitive Data types- Random Access Files.

UNIT V   **(15 Hours)**

Introducing Swings: Origins of swing- two keyswing features- components and containers- Swing Packages-Event Handling creating swing applet. Exploring Swing: Jlabel and ImageIcon- JtextField- The Swing Buttons-Jscroll Pane- Jlist- Jcombobox-Trees-Jtable.

* denotes Self Study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Books:

1. E.Balagurusamy "Programming with Java – A Primer", Fourth Edition -Tata McGraw-Hill Publication,.

2. Herbert Schildt, (2011),"Java the Complete Reference", Seventh Edition -Tata McGraw-Hill Publication

UCA32

Sub.Code: 21UCA409

Reference Books:

1. Steven Holzner, (2008), "Java 2 Programming – Black Book ", New Edition

2. C.Xavier,(2000), 'Programming with Java 2", Scitech Publication.

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	S	S	M
CO5	H	S	S	H	S

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

Sub.Code: 21UCA4CO

Programme Code : 10	Bachelor of computer applications		
Title of the paper	Core Practical 4 – Advanced Java Programming Lab		
Batch 2021-2022	Hours / Week 5	Total Hours 75	Credits 2

Course Objectives

1. To implement the advanced Java language syntax and semantics.

2. To implement concepts such as variables, conditional and iterative execution methods.

3. To make students to excel in coding, compiling and execute programs while learning advanced programming concepts.

Course Outcomes (CO)

K3 to K5	CO1	Applying the concepts of control structures, inheritance, method overriding in Java.
	CO2	Implementing the concept of interface, packages, multithreading and applets.
	CO3	Manipulating the operations using PL/SQL statements
	CO4	Validating the database using triggers.
	CO5	Evaluating software functionality to decide whether the Java programming can meet user requirements

LIST OF PRACTICAL PROGRAMS

1. Write a program to print the following triangle of numbers.

```
1
1 2
1 2 3
1 2 3 4
```

2.Write a java program to define a class, instance methods, overload them and use them for dynamic method invocation.

3. Write a program to display a message and draw several shapes in Applet window.

4. Write a program to create an applet and draw Grid lines.

5.Write a java program to create a frame with three text field for name, age and qualification and a text field of multiple lines for address to display PersonalDetails.

6.Write a java program to demonstrate the multiple selection list box.

7. Write a java program to create a menu bar and pull down menus

8. Write a java program to create a window when we press M/m the window displays Good Morning, A/a the window displays Good Afternoon, E/e the window displays Good Evening, N/n the window displays Good Night.

9. Write a program to move different shapes (Circle, Ellipse, Square, Rectangle) according to the arrow keypressed.

10. Write a java program to handle the divide by zero exception.

11. Write a java program to explain the multithreading with the use of multiplication tables. Three threads must be defined. Each one must create one multiplication table; they are 5 table, 7 table and 13 table.

12. Write a program to display all prime numbers between two limits using files concept.

13. Write a program to implement the concept of Concatenating and Buffering files in java.

14. Write a java program to Add Items and Remove Items using Swing components.

15. Write a program to implement the concept of Trees in java.

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

UCA35

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

Programme Code : 10	Bachelor of Computer Applications		
Title of the paper	**Allied Paper 4 – Organizational Behavior and Communicative Skills**		
Batch	**Hours / Week**	**Total Hours**	**Credits**
2021-2022	**6**	**90**	**5**

Course Objectives

1. To specify the intellectual and behavioral competencies that graduates should process.

2. To enable the students to insight in to the management techniques prevailing in the corporate world.

3. To be aimed at preparing young graduates to take up challenging careers in business and industry and enables them to pursue higher studies thereafter.

Course Outcomes (CO)

K1 to K5	CO1	Comprehend the requirement of communication in a company.
	CO2	Identifying and analyzing product life cycle and developing new products and product characteristics.
	CO3	Applying knowledge of pricing kinds of pricing and factors affecting changes in price.
	CO4	Applying motivational theories to improve the leadership qualities.
	CO5	Analyze the nature of organizational effectiveness.

Syllabus

UNIT I (18 Hours)

Management - Meaning and Definition – Features-Functions – Importance-Difference Between Administration And Management – Management Hierarchy.

Planning – Meaning – Nature-Objectives – Importance-Steps in Planning – Advantages and Limitations –Management by Objectives.

UNIT II (18 Hours)

Organization - Meaning-Functions-Principles- Types Of Organization-Merits& Demerits-Delegation Of Authority-Decentralization- Advantages & Disadvantages Departmentation - Meaning-Process-**Basis Types of Departmentation** *- Importance.

UNIT III   **(17 Hours)**

Staffing – Definition-Processing Of Staffing-Recruitment-Sources of Recruitment- Stages In Selection Procedure – Training And Development. Motivation- Meaning And Importance – Types – Theories Of Motivation – Maslow, McGregor, Hertzberg, Leadership – Need And Importance – Qualities Of Leadership – Leadership Styles.

UNIT IV   **(19 Hours)**

Communication: Meaning – Objectives – Process – Types - Media – Barriers – need and functions of business letter- Written Communication: Business letters-Drafting letters- Oral Communication: Telephone conversation. Conducting Meeting: Notice, Agenda, Minutes and Report writing.

UNIT V   **(18 Hours)**

Application Letters - Preparation of Resume - Interview: Meaning- Objectives and Techniques of various types of Interview- Public speech – Characteristics of a good speech.

* denotes Self Study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

Text Books:
1. L.M.Prasad, (2004), "Principles & Practice of Management", Sultan Chand & Son
    (Unit I, II & III).
2. R.S.N.Pillai and Bagavathi, Sultan Chand (2011), "Modern Commercial Correspondence",
    (Unit-IV)
3. Rajendran Pal and Koralhal,Sultan Chand(2011), "Essential of Business Communication",
    (Unit- V)

Reference Book:
   1. Tripathy and Reddy, "Principles of Management", Tata McGraw Hill (Unit I, II & III)
   2. Philip Kotler,(2004),"Marketing Management",Prentice Hall of India Unit IV)

UCA38

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	H	S	M	H
CO5	H	S	H	S	S

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

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)

K1 to K5	CO1	Learning the concepts of Visual Basic and .Net
	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.
	CO5	Enable students to develop projects using Visual Programming

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
CO5	H	S	H	S	S

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)

K1 to K5	CO1	Understand the concept of AI
	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.

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
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 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 K5	CO1	Identifying the key processes of data mining, data warehousing and knowledge discovery process.
	CO2	Understanding the concept of raw data processing using data mining algorithms.
	CO3	Analyze the various data mining techniques to solve problems in other disciplines.
	CO4	Develop practical work of techniques and design hypotheses based on the analysis.
	CO5	Evaluate and implement emerging methodologies to facilitate the knowledge discovery.

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
CO5	H	S	H	H	S

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

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)

K3 to K5	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
	CO5	Implementing Visual programming by using visual basic work environment to solve various real time problems.

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 ().

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	S	S	H

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

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.
	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 (17 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 (19 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 (19 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 (19 Hours)

Bootstrap: What is Bootstrap? Bootstrap History-Whyto 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
CO5	H	S	S	S	S

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	**Hours / Week**	**Total Hours**	**Credits**
2021-2022	**6**	**90**	**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)

K1 to K5	CO1	Studying the basic concepts of security.
	CO2	Understanding the issues and technologies in information security.
	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   (**Hours:17**)

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   (**Hours:19**)

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 (**Hours:16**)

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

UNIT IV (**Hours:19**)

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 (**Hours:19**)

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 pronograghy, 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, Assigments, Disussions.

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 SecurityFundamentals"**, Second Edition, Prentice Hall ,.

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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

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** **75**	**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)

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

LIST OF PRACTICAL PROBLEMS

1. Design a web page for your Department.

2. Design a new web page, which shows your Biodata using CSS.

3. Design a web page for a company using HTML Formatting Tags.

4. Design a web page for Computing Student Mark list 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 / 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: 21UCA6Z1

Programme Code:10	Bachelor of Computer Applications			
Core Project – Project Work & Viva – Voce *#**				
Batch	**Hours/Week**		**Total Hours**	**Credits**
2021-2022	**4**		**60**	**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	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	Section	Marks	Total
K3	Project Report	35	50
	Viva voce	15	

Teaching Methods

Power Point Presentation/Project Demo

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Sub.Code:21UCA6Z1

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Skill Based Subject 1 – Python Programming		
Batch 2021-2022	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To introduce the fundamentals of Python Programming.

2. To teach about the concept of Functions in Python.

3. To impart the knowledge of formatting and escape sequencing characters

Course Outcomes (CO)

	CO1	Remember the syntax of looping statements.
K1 to K5	CO2	Understand the concept of python scripts.
	CO3	Apply the concept of functions and user defined functions in programming.
	CO4	Analyze the concept of operators and looping statements in programming.
	CO5	Evaluate the concepts of exception handling and files.

Syllabus

UNIT I (6 Hours)

Introduction to Python: Introduction-Python Overview-Getting started with python-Comments-Python Identifiers-Reserved Keywords-Variables-Standard data types.

UNIT II (6 Hours)

Operators-Statement and expressions- String operations-Boolean expressions- Control statements- Iteration-While statement-Input from keyboard.

UNIT III (6 Hours)

Strings - List - Tuples - Dictionaries. ***Arrays in python:** Array-Creating Array-Types of Arrays-Working with Arrays using numpy.

UNIT IV (6 Hours)

Functions: Difference between a Function and a Method-Defining a Function -Calling a Function- Returning results from a Function-Returning Multiple Values from a Function-Structured Programming - Creating our own Modules in Python-The special Variable_name_.

UNIT V (6 Hours)

Introduction to OOPs: Specialty of Python Language-Features of Object Oriented Programming System-Classes and Objects- Encapsulation- Abstraction- Inheritance- Polymorphism .Classes and Objects: Creating a Class-The Self Variable –Constructor. Exceptions:- Errors in a Python Program-Exceptions-Exception Handling. Files in Python:-Files-Types of Files in Python-Opening a File-Closing a File**.**

Text Book

1. E. Balagurusamy, (2017), Problem Solving and Python Programming , First Edition- McGraw-

Hill Publication.

2. R.Nageswara Rao(2017), Core Python Programming,2017 Edition, Publication : dreamtech -press

Reference Books

1. Ashok Namdev Kamthane ,Amit Ashok Kamthane, (2017), Programming and

Problem Solving with Python, First Edition.

*denotes Self study

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

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	S	S	H	H	S

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Skill Based Subject 2 – Python Programming Lab		
Batch 2021-2022	Hours / Week 2	Total Hours 30	Credits 3

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.
	CO4	Appling the searching algorithm in programming.
	CO5	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.

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	M	H	M	S	H
CO2	H	S	M	H	S
CO3	M	H	M	M	H
CO4	S	H	H	M	H
CO5	S	S	S	S	H

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

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

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.
	CO4	Develop solutions for mathematical concept and propose appropriate result.
	CO5	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.

Sub.Code: 21UCA6S3

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

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

CO \ PSO	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
CO5	S	S	H	S	S

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

UCA65

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

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 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.

UCA66

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

Electives for Fifth and Sixth Semester

Programme code: 10	Bachelor of Computer Applications		
Title of the Paper	Elective 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 K5	CO1	Analyzing and evaluate the data received through sensors in IOT.
	CO2	Design and develop smart city in IoT
	CO3	Analyze various communication protocols for IoT.
	CO4	Analyze applications of IoT in real time scenario
	CO5	Evaluate appropriate protocol for communication between IoT.

Syllabus
UNIT I **(17 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 **(19 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 **(19 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: (19 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: (16 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
CO5	H	S	S	H	S

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

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

Batch	Hours/Week	Total Hours	Credits
2021-2022	6	90	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 K5	CO1	Understand the use of various open source software available in the industry.
	CO2	Summarize the basic concepts of how a database stores information via tables.
	CO3	Learn how to use lists, tuples, and dictionaries in Python programs.
	CO4	Applying exception handling methods in Python programs.
	CO5	Evaluate applications by applying programming concepts to solve real time problems.

Syllabus

UNIT 1   **(17 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   **(16 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   **(19 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   **(19 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   **(19 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
CO5	H	S	S	H	S

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

UCA71

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Elective 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)

K1 to K5	CO1	Learning the working process of Android applications
	CO2	Developing Android 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
	CO5	Evaluate the tools by applying fundamental concepts to Android application development.

Syllabus

UNIT I (17 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 (19 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   **(19 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   **(19 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   **(16 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 ".

UCA73

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
CO5	H	S	H	S	H

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

Programme code:10	Bachelor of Computer Applications		
Title of the Paper	Elective Paper – Big Data and Analytics		
Batch 2021-2022	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To know the fundamental concepts of big data and analytics.

2. To explore tools and practices for working with big data.

3. To learn about stream computing and to know about the research that requires the integration of large amounts of data.

Course Outcomes (CO)

K1 to K5	CO1	Identify the need for Big Data analysis
	CO2	Develop ability to analyze and process Big Data
	CO3	Build necessary skills to process Big Data by identifying the use case.
	CO4	Acquire knowledge about Hadoop Ecosystem.
	CO5	Disseminate the new knowledge and implement into the organization

Syllabus

UNIT I (16 Hours)

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

UNIT II (19 Hours)

Big Data Adoption and Planning Considerations: Organization Prerequisites - Data Procurement Privacy - Security - Provenance - Limited Real-time Support - Distinct Performance Challenges - Distinct Governance Requirements - Distinct Methodology – Clouds - Big Data Analytics Lifecycle.
Enterprise Technologies and Big Data Business Intelligence: Online Transaction Processing (OLTP) - Online Analytical Processing (OLAP) - Extract Transform Load (ETL) - Data Warehouses - Data Marts - Traditional BI - Ad-hoc Reports - Dashboards - Big Data BI- Traditional Data Visualization - Data Visualization for Big Data.

UNIT III (17 Hours)

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

UNIT IV **(19 Hours)**

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

UNIT V **(19 Hours)**

In-Memory Storage Devices - In-Memory Data Grids - Read-through - Write-through - Write-behind - Refresh-ahead- In-Memory Databases. **Big Data Analysis Techniques**: Quantitative Analysis - Qualitative Analysis - Data Mining - Statistical Analysis - A/B Testing - Correlation - Regression - Machine Learning - Classification (Supervised Machine Learning- Clustering (Unsupervised Machine Learning) - Outlier Detection – Filtering - Semantic Analysis - Natural Language Processing - Text Analytics - Sentiment Analysis - Visual Analysis - Heat Maps - Time Series Plots - Network Graphs - Spatial Data Mapping.

* denotes Self study

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

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

Teaching Methods

Smart ClassRoom/Powerpoint presentation/Seminar/Quiz/Discussion

UCA76

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

Programme Code:10	Bachelor of Computer Applications		
Title of the Paper	Elective 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 K5	CO1	Understand the features of Virtual environment
	CO2	Understand the Virtual Hardware and software's
	CO3	Identify Virtual Reality toolkits
	CO4	Explore the basic awareness of theoretical contexts relevant to virtual reality
	CO5	Demonstrate an understanding of techniques, processes, technologies and equipment used in immersive virtual reality

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 Virtualworld 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   **(18 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   **(18 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.

Teaching Methods:

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

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
CO5	H	S	H	S	S

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

UCA79

Programme Code : 10	Bachelor of Computer Applications		
Title of the Paper	Elective Paper - Cloud Computing and Azure		
Batch	Hours / Week	Total Hours	Credits
2021-2022	6	90	5

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 K5	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
	CO5	Evaluate the fundamental concepts of cloud storage and demonstrate their use in storage systems

Syllabus

UNIT-I **(17 Hours)**

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

UNIT-II **(16 Hours)**

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

UNIT III **(19 Hours)**

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 **(19 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   **(19 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
CO5	H	S	H	S	H

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

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

Course Outcomes (CO)

K1 to K5	CO1	To understand the hidden truth of Human Rights by studying various theories.
	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

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- Social Awareness and Responsibilities of Individuals.

UNIT – V

Rights of Women, Child, Refugees and Minorities – Social Media and HumanRights - 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.

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

Programme Code: 10		Bachelor of Computer Applications		
Course Code:21UWR4N2		Part IV -Non- Major Elective – II Women's Rights		
Batch 2021-2022	Semester IV	Hours / Week 2	Total Hours 30	Credits 2

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)

After Completion of the Course the student will be able to

K1toK5	CO1	Appraise the importance of Women's Studies and incorporate Women's Studies with other fields.
	CO2	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication.
	CO3	Interpret the laws pertaining to violence against Women and legal consequences.
	CO4	Contribute to the study of the important elements in the Indian Constitution, Indian Laws for Protection of Women.
	CO5	Spell out and implement Government Developmental schemes for women and create awarenesson modernization and impact of technology on Women.

Syllabus

Unit I (6 Hours)

Women's Studies:

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

Unit II (6 Hours)

Socio-Economic Development of Women:

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

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), Published 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.

Question Paper Pattern

Duration :3 hrs   Max: 75 marks

Section A (5 X 5=25 Marks)

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

Section B (5X10=50 Marks)

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

Programme Code : 10	Bachelor of Computer Applications		
Non- Major Elective – Consumer Affairs			
Batch 2021-2022	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

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

UCA87

SUGGESTED READINGS:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, UniversitiesPress.

2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications PvtLtd.

3. G. Ganesan and M. Sumathy. (2012). Globalisation and Consumerism: Issues and Challenges, RegalPublications

4. Suresh Misra and Sapna Chadah (2012). Consumer Protection in India: Issues and Concerns, IIPA, NewDelhi

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

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

7. E-books :-www.consumereducation.in

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

9. ebook,www.bis.org

10. The Consumer Protection Act, 2086 and its later versions.

<div align="center">

Question paper pattern (External Only)

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Duration: 3 hrs   Max: 75 Marks

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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.

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Sub.Code: 21EVS101

Title: For B.A., BBA, B.Com, BCA and B.Sc., Degree Students				
PART IV – ENVIRONMENTAL STUDIES				
Batch 2021-2022	Semester I	Hours / Week 2	Total Hours 30	Credits 2

COURSE OBJECTIVES

● The course will provide students with an understanding and appreciation of the complex interactions of man, health and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences

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

● To shape students into good "Ecocitizens" thereby catering to global environmental needs.

● This course is designed to study about the types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling and principles of environmental pollution such as air, water and soil

● The course will address environmental stress and pollution, their sources in natural and workplace environments, their modes of transport and transformation, their ecological and publichealth effects, and existing methods for environmental disease prevention and remediation.

COURSE OUTCOMES

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

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

UNIT I MULTIDISCIPLINARY NATURE OF ENVIRONMENT   (6 HOURS)

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

UNIT II ECOSYSTEMS   (6 HOURS)

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

UNIT III BIODIVERSITY AND ITS CONSERVATION   (6HOURS)

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

UNIT IV ENVIRONMENTAL POLLUTION   (6 HOURS)

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

UNIT V SOCIAL ISSUES AND THE ENVIRONMENT   (6 HOURS)

Sustainable Development – Smart City, Urban planning, Town Planning , Urban problems related to energy – Water Conservation: Rain Water Harvesting and Watershed Management – Resettlement and rehabilitation of people, its problems and concerns, case studies Narmatha Valley Project – Environmental ethics, issues and possible solutions – Climate change, global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust, case studies – Hiroshima and Nagasaki, Chernobyl – Consumerism and waste products – Environmental Protection Act – Air Pollution Act (Prevention and Control) – Water Pollution Act (Prevention and control) – Wild Life Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness – Human Population and the environment – Population Growth and Distribution – Population Explosion – Family Welfare Programme – Environment and Human Health – Human Rights – Value Education – HIV/ AIDS – Women and Child Welfare – Role of Information Technology in Environment and Human Health.

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 .

Text Book

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

References

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

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

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

Programme Code: 10	Bachelor of Computer Applications		
MORAL AND ETHICS			
Batch 2021-2022	Hours / Week 2	Total Hours 30	Credits 2

Course Objectives

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

Course Outcomes (CO)

After completing the course the students:

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

Syllabus

UNIT I: **4 Hours**
   Moral and Ethics: Introduction – Meaning of Moral and Ethics – Social Ethics – Ethics and Culture – Aim of Education.

UNIT II: **6 Hours**
   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 – KayakalpaYogam - 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 Books:
   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.

Question paper pattern
(External only)

Duration: 3 hrs   Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)
Essay type, either or type questions from each unit.

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]

Duration: 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)