KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2023 – 2024 and Onwards)

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

Coimbatore – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

Vision:

- ✓ The Department of Computer Technology strives to provide a rigorous intellectual environment that fosters the search for new knowledge in a highly dynamic computing-centric society and changing students into critical thinkers and lifelong learners who can apply their knowledge and skills for the betterment of society.

Mission:

- ✓ Provide a current, comprehensive, and collaborative student-centered learning environment for Computer Technologies and professional values associated withdiscipline. Prepare students for professional careers. Promote the discovery, dissemination and application of computing knowledge.

PROGRAMME OUTCOMES (PO)

PO1   Enhance the skills and new computing technologies through practical and theoretical knowledge of computer science and software engineering.

PO2   Pursue higher education or practice as computing professionals to earn a living and to contribute to the economic development of the region, state and nation.

PO3   Apply the knowledge in Computer Science required to work as a team as well as to lead a team.

PO4   Ability to analyze a problem, identify and define the computing requirements appropriate to its solution.

PO5   Apply basic terminologies and principles in problem solving scenarios through various hands on experiences.

PO6   Work as Hardware Designers with the knowledge of Networking Concepts.

PO7   Ability to apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computer-based systems.

PO8   Analyze the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1   Identify, formulate and solve computer related problems in a way that demonstrates comprehension of the tradeoffs involved in.

PSO2   An ability to select and apply current techniques, skills, and tools necessary for problem solving and integrate Computer Technology based solutions into the user environment effectively.

PSO3   Apply design and development principles in the construction of software systems of varying complexity.

PSO4   Provide effective and efficient real time solutions using acquired knowledge in various domains.

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.

UCT 1
KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE – 641 029
Course Name : **B.SC COMPUTER TECHNOLOGY [B.Sc CT]**
Curriculum and Scheme of Examination under CBCS
(Applicable to the students admitted during the Academic Year 2023-2024)

Semester	Part	Subject Code	Title of the Paper	Instruction hours/cycle	CIA	ESE	TOTAL	Duration of Exam (hours)	Credits
					Exam. Marks				
I	I	23TML101	Language I@	6	25	75	100	3	3
	II	23ENG101	English -I	6	25	75	100	3	3
	III	23UCT101	Core Paper 1 - C Programming	5	25	75	100	3	4
	III	23UCT1CL	Core Practical 1 – C Programming Lab	5	40	60	100	3	2
	III	23UCT1A1	Allied Paper 1 - Discrete Mathematics and Statistics	6	25	75	100	3	5
	IV	23EVS101	Environmental Studies **	2	**-**	**50**	**50**	3	2
			Total	**30**	-	-	**550**	-	**19**
II	I	23TML202	Language II@	6	25	75	100	3	3
	II	23ENG202	English –II	4	25	25	50 @@	3	1
	II	23UGN2NM	Effective English: Language Proficiency for Employability http://kb.naanmudhalvan.in/Special:File path/Cambridge_Course_Details.pdf	2	25	25	50 ##		2
	III	23UCT202	Core Paper 2 - Digital Logic and Circuit Designs	4	25	75	100	3	4
		23UCT203	Core Paper 3 - Object Oriented Programming with C++	3	25	75	100	3	4
	III	23UCT2CM	Core Practical 2 - Object Oriented Programming with C++ Lab	3	40	60	100	3	2
	III	23UCT2A2	Allied Paper 2 - Operations Research	6	25	75	100	3	5
	IV	23VED201	Value Education- Moral and Ethics**	2	-	50	50	3	2
			Total	**30**	-	**-**	**650**	-	**23**
III	I	23TML303	Language III@	6	25	75	100	3	3
	II	23ENG303	English –III	6	25	75	100	3	3
	III	23UCT304	Core Paper 4 - Java Programming	5	25	75	100	3	5
	III	23UCT3CN	Core Practical 3 - Java Programming Lab	5	40	60	100	3	3
	III	23UCT3A3	Allied Paper 3 – Organizational Behavior and Communication Skills	4	25	75	100	3	5
	IV	23UGC3S1	Skill Based Subject 1 - Cyber Security	2	100	-	100	3	3
	IV	23TBT301/ 23TAT301/ 23UHR3N1	Basic Tamil* / Advanced Tamil** / Non Major Elective 1 **	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**24**
IV	I	23TML404	Language - IV @	6	25	75	100	3	3
	II	23ENG404	English – IV	6	25	75	100	3	3
	III	23UCT405	Core Paper 5 - .NET Framework	4	25	75	100	3	5
	III	23UCT4CO	Core Practical 4 - .NET Framework Lab	5	40	60	100	3	3
	III	23UCT4A4	Allied Paper 4 –Computer System Architecture	4	25	75	100	3	5

				UCT 2						
	IV	23UCT4SL	Skill Based Subject 2- Database Management Lab	2	25	25	50@@	3	1
	IV	23UCT4NM ###	Office Fundamentals :Digital Skills for Employability http://kb.naanmudhalvan.in/Special:Filepath/Microsoft_Course_Details.xlsx	1	25	25	50 ##		2
	IV	23TBT402/ 23TAT402/ 23USG4N2	Basic Tamil* / Advanced Tamil**/ Non-Major Elective- II **	2	-	75	75	3	2
			Total	**30**	**-**	**-**	**675**	**-**	**24**
V	III	23UCT506	Core Paper 6 - PHP	6	25	75	100	3	5
	III	23UCT507	Core Paper 7 - Computer Networks	5	25	75	100	3	4
	III	23UCT508	Core Paper 8 - Operating Systems	5	25	75	100	3	5
	III	23UCT5E1	Major Elective – 1	6	25	75	100	3	5
	III	23UCT5CP	Core Practical 5 – PHP Programming Lab	6	40	60	100	3	2
	IV	-	Extra Departmental Course	2	100	-	100	3	3
	-	23UCT5SP	Aptitude and Logical Reasoning****				Grade		
			Total	**30**	**-**	**-**	**600**	**-**	**24**
VI	III	23UCT609	Core Paper 9 - Software Engineering and Testing	5	25	75	100	3	5
	III	23UCT610	Core Paper 10 – Python Programming	5	25	75	100	3	5
	III	23UCT6CQ	Core Practical 6 – Python Programming Lab	6	40	60	100	3	2
	III	23UCT6E2	Major Elective – 2	6	25	75	100	3	5
	III	23UCT6Z1	Project and Viva-Voce***	4	20	80	100	-	5
	III	23UCT6SM	Skill Based Subject 3 – Hardware Installation and Networking Lab	2	25	25	50@@	3	1
	IV	23UCT6NM ###	Naan Mudhalvan–Skill Course Machine Learning http://kb.naanmudhalvan.in/images/1/19/PBL_Google.pdf	2	25	25	50 ##		2
			Total	**30**	**-**	**-**	**700**	**-**	**25**
	V	23NCC$/NSS/ YRC/ PYE / ECC / RRC / WEC101#	Co-curricular Activities *		50	-	50	-	1
			Grand Total	**-**	**-**	**-**	**3800**	**-**	**140**

UCT 3

Note :

CBCS – Choice Based Credit system

CIA– Continuous Internal Assessment

ESE– End of Semester Examinations

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

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

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

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

@ Hindi/Malayalam/ French/ Sanskrit – 23HIN/MLM/FRN/SAN101 - 404

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

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

*** Project Report- 60 Marks; Viva-Voce-20 Marks; Internal-20 Marks. Four hours allotted for Project will not be allocated for Staff Workload.

& The department may choose any skill course from the list of courses prescribed by the Naan Muthalvaan Scheme.

**** - Aptitude and Logical Reasoning: The Written examination will be conducted and evaluated for 100 marks. 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)

UCT 4

Major Elective Papers

(2 papers are to be chosen from the following 6 papers)
1. Cloud Computing
2. Data Structures and Algorithms
3. Data Mining and Warehousing
4. Big Data Analytics and Data Science
5. Artificial Intelligence
6. Virtual Reality and Augmented Reality

Non-Major Elective Papers
1. Human Rights
2. Women's Rights
3. SOGIESC Studies

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

23UCT5XL – Web Development and Google App Lab

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

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

Tally Table:

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

UCT 5

- 50 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra credit courses.
- 100 % CIA for FC, Cyber Security, EDCand Online course.
- The students should complete any **MOOC On learning platforms like SWAYAM, NPTEL, Course era, IIT Bombay Spoken Tutorial etc.,** before the completion of the 5th semester and the course completion certificate should be submitted through the HOD to the Controller of Examinations. Extra credits will be given to the candidates who have successfully completed.
- An **Onsite Training** preferably relevant to the course may be undertaken as per the discretion of the HOD.

Components of Continuous Internal Assessment

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

UCT 6
BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

1. **Theory Examination:**

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

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

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

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

**For ESE 50 marks converted to 25 marks.

2. ESE Practical Examination:

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

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

3. ESE Project Viva Voce:

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

Sub. Code**: 23UCT101**

Programme Code : 11	B. Sc Computer Technology		
Title of the Paper: **Core Paper 1 – C Programming**			
Batch 2023 - 2024	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.

2. To develop an in-depth understanding of functional and logical concepts of C Programming.

3. To provide exposure to problem-solving through C programming.

4. To familiarize the basic syntax and semantics of C Language.

Course Outcomes (CO)

	CO1	Recollect various programming constructs and to develop C programs.
K1 to K5	CO2	Understand the fundamentals of C programming.
	CO3	Choose the right data representation formats based on the requirements of the problem.
	CO4	Analyze different Operations on arrays, functions, and pointers,
	CO5	Evaluate the usage of structures, unions and files.

Syllabus

UNIT I   **15 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– Type conversions in Expressions – Operator precedence and Associativity - Managing Input and Output operations: Reading and Writing Character - Formatted Input – Formatted Output.

Sub. Code: **23UCT101**

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. Looping: The while statement – The do statement – The for statement – **Jumps in loops***.

UNIT III   **15 Hours**

Arrays : Introduction – one dimensional Arrays – Declaration of one dimensional Arrays – 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 – Passing Arrays to Functions – The Scope, Visibility and Lifetime of Variables.

UNIT IV   **15 Hours**

Pointers : Understanding pointers –Accessing the Address of the Variable- Declaring pointer variables – Pointer and Arrays- Pointers and Character strings – Array of pointers – Pointers as Function Arguments- Functions returning pointers.

UNIT V   **15 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 File – Input / Output Operations on Files – Command Line Arguments.

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

TEACHING METHODS:

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

Sub. Code: **23UCT101**

TEXT BOOK

1. E. Balagurusamy, (2011), **Programming in ANSI C**, Fifth Edition, Tata Mc Graw Hill Publication.

REFERENCE BOOKS

1. Ashok N Kamthane, (2007), **Programming with ANSI and Turbo C**, Pearson Education Publication.
2. P.J.Deitel and H.M.Deitel, (2008), **C How to Program**, Fifth Edition, Tata Mc Graw Hill Publication.

MAPPING

PSO CO	PSO 1	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	S	M	S	S	S

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

Sub. Code: **23UCT1CL**

Programme Code : 11	B. Sc Computer Technology		
Title of the Paper: **Core Practical 1 – C Programming Lab**			
Batch 2023 - 2024	**Hours / Week** 5	**Total Hours** 75	**Credits** 2

Course Objectives

1. To introduce the field of programming using C language.

2. To enhance the analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes (CO)

K3 to K5	CO1	Develop logical and programming skills using the fundamentals and basics of C Language.
	CO2	Apply effective usage of arrays and strings.
	CO3	Implement functions to arranging set of values using different sorting techniques.
	CO4	Apply pointers to perform memory management.
	CO5	Implement files and command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a C program to find the roots of a Quadratic Equation.

2. Write a C program to find the greatest and smallest number from set of numbers.

3. Write a C program to find the sum, average, standard deviation from set of numbers.

4. Write a C program to find the given input is a palindrome or not.

5. Write a C program to perform String functions.

6. Write a C program to arrange a set of numbers in ascending order using bubble sort.

7. Write a program to convert decimal to binary using recursive function.

8. Write a C program Using function to perform following operation.

   ✓ Read two integer arrays with unsorted elements.

   ✓ Sort them into ascending order.

   ✓ Merge the sorted arrays and print the elements.

9. Write a generalized program to perform matrix operation.

10. Write a program to print the student's mark statement using Structure.

11. Write a program to manipulate array elements using Pointers.

12. Write a program to display an image using graphics in C.

13. Write a program, which takes a file as command line argument, and copy it to another file. At the end of the second, file writes

- ✓ Number of characters
- ✓ Number of words
- ✓ Number of lines

Guidelines to the distribution of marks for practical examinations

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

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

Teaching Methods

Presentation and Program demonstration using Projector

MAPPING

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

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

Programme Code : 11	B. Sc Computer Technology
Title of the Paper : **Part IV - Environmental Studies****	

Batch	Hours / Week	Total Hours	Credits
2023 - 2024	2	30	2

Course Objectives

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

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

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

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

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

Course Outcomes (CO)

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

K1 to K5	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.

Syllabus

UNIT I   MULTIDISCIPLINARY NATURE OF ENVIRONMENT   6 Hours

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

UNIT II   ECOSYSTEMS   6 Hours

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

UNIT III   BIODIVERSITY AND ITS CONSERVATION   6 Hours

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

UNIT IV   ENVIRONMENTAL POLLUTION   6 Hours

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

UNIT V   SOCIAL ISSUES AND THE ENVIRONMENT   6 Hours

Sustainable Development – Smart City, Urban planning, Town Planning , Urban problems related to energy – Water Conservation: Rain Water Harvesting and Watershed Management – Resettlement and rehabilitation of people, its problems and concerns, case studies Narmatha Valley Project – Environmental ethics, issues and possible solutions – Climate change, global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust, case studies –

Hiroshima and Nagasaki, Chernobyl – Consumerism and waste products – Environmental Protection Act – Air Pollution Act (Prevention and Control) – Water Pollution Act (Prevention and control) – Wild Life Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness – Human Population and the environment – Population Growth and Distribution – Population Explosion – Family Welfare Programme – Environment and Human Health – Human Rights – Value Education – HIV/ AIDS – Women and Child Welfare – Role of Information Technology in Environment and Human Health.

Teaching methods

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

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.

REFERENCE BOOKS

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

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

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

Question Paper Pattern

Duration: 3 hours   Total Marks : 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

Sub. Code: **23UCT202**

Programme Code : 11	B. Sc Computer Technology		
Title of the Paper : **Core Paper 2 – Digital Logic and Circuit Designs**			
Batch 2023 - 2024	**Hours / Week** 4	**Total Hours** 60	**Credits** 4

Course Objectives

1. The students should get the Knowledge about the Number System, Number representation and Number Conversion.
2. To learn the concept of Digital Circuits, Circuit Constructions and Simplifications of Boolean functions.
3. To know the concept of Arithmetic Circuits, Combination Circuits, Counters and Registers.

Course Outcomes (CO)

K1 to K5	CO1	Retain the information about the Computer Number systems and conversions in Digital Computer System.
	CO2	Understand the concepts of Boolean expressions, Logic Gates and toapply the methods to simplifying the Boolean expression.
	CO3	Apply the knowledge to perform arithmetical operations using various logical circuits and to design various Synchronous and Asynchronous.
	CO4	Analyse the function of Counters and Registers.
	CO5	Evaluate the working nature of various Flip-Flops and Circuits.

Syllabus

UNIT I   **14 Hours**

Number System and Codes: Introduction – Number System – Floating Point Representation of Numbers - Arithmetic Operation – 1's and 2's Complement – 9's and 10's Complement – BCD – Codes. Logic Gates: Introduction – Logic Gates.

Sub. Code: **23UCT202**

UNIT II   **10 Hours**

Boolean Algebra and Minimization Techniques: Introduction – Boolean Logic Operations – Basic Laws of Boolean Algebra – Demorgan's Theorems – Sum of Products and Product of Sums – Karnaugh Map(Upto Four Variable).

UNIT III   **12 Hours**

Arithmetic Circuits: Introduction – Procedure – Half-Adder – Full-Adder – Half-Subtractor - Full-Subtractor - Parallel Binary Adder – Serial Adder - BCD Adder – Binary Multiplier – Binary Divider.

UNIT IV   **12 Hours**

Combination Circuits : Multiplexer – De-multiplexer – Decoder – Encoders. Flip-Flops: Introduction – Latches – Flip-Flops: S-R, D, J-K and T – **Triggering of Flip-Flops***.

UNIT V   **12 Hours**

Counters : Introduction – Asynchronous Counter – Synchronous Counters. Registers: Introduction – Shift Registers – Shift Counters.

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

TEACHING METHODS:

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

TEXT BOOK

1. S. Salivahanan, S.Arivazhagan, (2007), **Digital Circuits and Design**, 3rd Edition.

REFERENCE BOOKS

1. Morris Mano, (2011), **Digital Logic and Computer Design**, Thirteenth impression,Tata McGraw Hill Publication. (UNIT I, II and III)
2. Leach Malvnio, (2005), **Digital Principles & Application** , Fifth Edition, Tata McGraw Hill Publication.

Sub. Code: **23UCT202**

MAPPING

PSO CO	PSO 1	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	M	S	S

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

Sub. Code: **23UCT203**

Programme Code : 11	B. Sc Computer Technology
Title of the Paper : **Core Paper 3 – Object Oriented Programming with C++**	

Batch	Hours / Week	Total Hours	Credits
2023 - 2024	3	45	4

Course Objectives

1. To develop a greater understanding of the issues involved in programming language design and object oriented paradigms and its implementation.

2. To impart adequate knowledge on the need of object oriented programming languages.

3. To enhance problem solving and programming skills in C++ by implementing the object oriented concepts.

Course Outcomes (CO)

K1 to K5	CO1	Remember the characteristics of Procedure and Object Oriented Programming Languages.
	CO2	Understand the fundamentals of C++ programming structure, function overloading and constructors.
	CO3	Examine different C++ features such as composition of objects, Operator overloading and inheritance.
	CO4	Analyse the performance of run-time polymorphism using pointers and virtual functions.
	CO5	Evaluate the usage of object oriented programming in terms of software reuse and managing complexity to solve real-world problems.

Syllabus

UNIT I   **9 Hours**

Principles of OOP: Software Evolution - Procedure versus OOPS - Basic concepts of oops-Benefits of OOPS - Object Oriented Languages - Applications of OOPS.

Beginning with C++: History - Simple C++ Program - Structure of C++ Program. Tokens, Data types, Reference Variables – Typecasting – Operators - Control Structures.

UNIT II   **9 Hours**

Functions: Function Prototyping - Call by reference - Return by reference - Inline function -Default arguments - Function Overloading.

Classes & Objects: Specifying a class - Defining member function-Member allocation for objects - Static member - Array of objects - Object as function arguments - friend functions - returning objects - pointers to members.

UNIT III   **9 Hours**

Constructors & Destructors: Constructor and its types - **Destructors*.**

Operator Overloading: Definition - Overloading unary and binary operators - Manipulation of strings using operators - Rules for operator overloading - Type conversions.

Inheritance: Introduction - Defining derived classes - Types of inheritance - Virtual base classes - Abstract- Constructors in derived classes.

UNIT IV   **9 Hours**

Pointers: Declaration - Pointers to objects - Pointers to derived class - this pointer- Polymorphism & virtual functions. Managing console I/O operations - Formatted & Unformatted I/O.

UNIT V   **9 Hours**

Files: Classes for file stream operations - Opening and closing a file - Detecting EOF - Manipulation of file pointers - Sequential I/O operations - **Command line arguments***.

Exception handling: Basics of exception handling - Exception handling mechanism - Try,Catch, Throw.

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

Teaching Methods

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

Sub. Code : **23UCT203**

TEXT BOOK

1. E. Balagurusamy, (2012), **Object Oriented Programming with C++,** Fifth Edition, TataMc Graw Hill Publication.

REFERENCE BOOKS

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

2. Yashavant Kanetkar, (2004**), Introduction to Object Oriented Programming and C++,** First Edition, BPB Publication.

MAPPING

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

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

Sub. Code : **23UCT2CM**

Programme Code : 11	B. Sc Computer Technology
Title of the Paper : **Core Practical 2 – Object Oriented Programming with C++ Lab**	

Batch 2023 - 2024	Hours / Week 3	Total Hours 45	Credits 2

Course Objectives

1. To develop the programs for solving the problems using function overloading, constructors, classes and object.

2. To apply the object oriented programming concepts to solve the problems.

Course Outcomes (CO)

	CO1	Implement the concepts of object oriented programming.
K3 to K5	CO2	Apply string functions to perform operator overloading.
	CO3	Analyze virtual functions and inheritance.
	CO4	Apply sequential file I/O operations to manipulate a text file
	CO5	Evaluate the implementation of command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a C++ program to implement the concept of functions and friend functions.

2. Write a C++ program to perform on concept of function overloading.

3. Write a C++ program to implement the concept of classes and objects.

4. Write a C++ program to perform arithmetic operations using constructors and destructors.

5. Write a C++ program to perform function overloading using this pointer.

6. Write a C++ program to perform Operator Overloading concept.

7. Write a C++ program to perform string manipulation operations.

8. Write a C++ program to prepare employee pay slip using console I/O.

9. Write a C++ program to find Area and Perimeter using Virtual function and inheritance concept.

10. Write a C++ program to perform file manipulations and export the file.

11. Write a C++ program to perform file copy using command line arguments.

12. Write a C++ program using exception handling,

Guidelines to the distribution of marks for practical examinations

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

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

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

Teaching Methods

Presentation and Program demonstration using Projector.

MAPPING

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

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

Programme Code : 11	B. Sc Computer Technology

Title of the Paper : **Part IV - Value Education - Moral and Ethics****

Batch	Hours / Week	Total Hours	Credits
2023 - 2024	2	30	2

Course Objectives

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

Course Outcomes (CO)

K1 to K5	CO1	Will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	CO2	Will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	CO3	Can emulate the principled life of great warriors and take it forward as a message to self and the society
	CO4	Will be able to 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 – Kayakalpa Yogam - LifeForce – Aim & Objectives – Principle – Methods. Introspection – Analysis of Thoughts – Moralization of Desires – Neutralization of Anger – Eradication of Worries

UNIT V   **8 Hours**

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

 Teaching methods

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

TEXT BOOK

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

REFERENCE BOOKS

1. Swami Vivekananda – A Biography, **Swami Nikhilananda, Advaita Ashrama,** India, 24thReprint 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.

Value Education – Moral & Ethics
Question Paper Pattern (External only)

Duration: 3 Hours   Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.