KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029

DEPARTMENT OF COMPUTER TECHNOLOGY

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2019 - 2020 onwards)

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

Coimbatore – 641029

Vision:

- ✓ Developing the total personality of each and 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 values - moral and ethical.
- ✓ Designing the curriculum and other courses that transform its students into value added and 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.
- ✓ Motivating teachers in such a way that they become the role models in promoting Higher Education.

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 with discipline. 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.

KONGUNADU ARTS AND SCIENCE COLLEGE [AUTONOMOUS]
COIMBATORE - 641 029

B.Sc. COMPUTER TECHNOLOGY [B.Sc. CT]

Curriculum and Scheme of Examination under CBCS

(Applicable to the Students Admitted during the Academic Year 2019-2020)

Semester	Part	Subject Code	Title of the Paper	Instruction hours / Cycle	Exam. Marks			Duration of Exam(hours)	Credits
					CIA	ESE	Total		
I	I	19TML1A1	Language I @	6	25	75	100	3	3
	II	19ENG101	English I	6	25	75	100	3	3
	III	19UCT101	C.P.1 C Programming	5	25	75	100	3	4
	III	19UCT1CL	C.Pr.1 C Programming Lab	5	40	60	100	3	2
	III	19UCT1A1	Allied 1 - Discrete Mathematics and Statistics	6	25	75	100	3	5
	IV	19EVS101	Environmental Studies **	2	-	50	50	3	2
Total				**30**	-	-	**550**	-	**19**
II	I	19TML2A2	Language II @	6	25	75	100	3	3
	II	19ENG202	English II	6	25	75	100	3	3
	III	19UCT202	C.P.2 Digital Logic and Circuit Designs	3	25	75	100	3	4
	III	19UCT203	C.P.3 Object Oriented Programming with C++	3	25	75	100	3	4
	III	19UCT2CM	C.Pr.2 Object Oriented Programming with C++ Lab	4	40	60	100	3	2
	III	19UCT2A2	Allied 2 – Operations Research	6	25	75	100	3	5
	IV	19VED201	Value Education - Moral and Ethics**	2	-	50	50	3	2
Total				**30**	-	-	**650**	-	**23**
III	III	19UCT304	C.P.4 Advanced Operating Systems	5	25	75	100	3	4
	III	19UCT305	C.P.5 Data Structures and Analysis of Algorithms	5	25	75	100	3	4
	III	19UCT306	C.P.6 Advanced Java Programming	5	25	75	100	3	4
	III	19UCT3CN	C.Pr.3 Advanced Java Programming Lab	5	40	60	100	3	2
	III	19UCT3A3	Allied 3 – Business Accounting	6	25	75	100	3	5

	IV	19UCT3S1	Skill Based Subject 1 - Programming Language in Python	2	25	75	100	3	3
	IV	19TBT301/ 19TAT301/ 19UHR3N1	Basic Tamil*/Advanced Tamil**/ Non Major Elective 1 – Human Rights **	2	-	75	75	3	2
			Total	**30**	-	-	**675**	-	**24**
IV	III	19UCT407	C.P.7 Relational Database Management Systems	5	25	75	100	3	4
	III	19UCT408	C.P.8 .NET Framework	4	25	75	100	3	4
	III	19UCT409	C.P.9 Computer Networks	5	25	75	100	3	4
	III	19UCT4CO	C.Pr.4.NET Framework and Oracle Lab	6	40	60	100	3	2
	III	19UCT4A4	Allied 4 - Computer System Architecture	6	25	75	100	3	5
	IV	19UCT4SL	Skill Based Subject 2 - Python Programming Lab	2	40	60	100	3	3
	IV	19TBT402/ 19TAT402/ 19UWR4N2	Basic Tamil*/Advanced Tamil**/ Non Major Elective 2 - Women's Rights **	2	-	75	75	3	2
			Total	**30**	-	-	**675**	-	**24**
V	III	19UCT510	C.P.10 Software Engineering and Testing	5	25	75	100	3	5
	III	19UCT511	C.P.11 Wireless Ad-Hoc Network	5	25	75	100	3	5
	III	19UCT512	C.P.12 Data Mining and Warehousing	6	25	75	100	3	5
	III	19UCT5E1	Major Elective I	6	25	75	100	3	5
	III	19UCT5CP	C.Pr.5 Software Testing Lab	6	40	60	100	3	2
	IV	-	Extra Departmental Course	2	40	60	100	3	3
		19UCT5SP	Aptitude and Logical Reasoning****	Grade					
			Total	**30**	-	-	**600**	-	**25**
VI	III	19UCT613	C.P.13 PHP	6	25	75	100	3	5
	III	19UCT614	C.P.14 Information Security	6	25	75	100	3	4
	III	19UCT6CQ	C.Pr.6 Programming Lab-PHP	6	40	60	100	3	2
	III	19UCT6E2	Major Elective II	6	25	75	100	3	5
	III	19UCT6Z1	Project Work & Viva - Voce ***	4	20	80	100	-	5
	IV	19UCT6SM	Skill Based Subject 4 - Hardware Installation and Networking Lab	2	40	60	100	3	3

	V	**19NCC/NSS/ YRC/PYE/ ECC/RRC/ WEC101#**	Extension Activities*	-	50	-	50	-	1
			Total	**30**			**650**		**25**
			Grand Total	-	-	-	**3800**	-	**140**

Note:

CBCS - Choice Based Credit System

CIA - Continuous Internal Assessment

ESE - End of Semester Examinations

@ Hindi/Malayalam/French/Sanskrit – 19HIN/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.

**** 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)

Major Elective Papers

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

1. Web Development Languages
2. Cloud Computing
3. Digital Image Processing
4. Embedded Systems
5. Principles of Data Science
6. Artificial Intelligence

Non-Major Elective Papers

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

Subject Code and Title of the Extra Departmental Course (EDC):

19UCT5X1-Web Development and Google App Lab

 # 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.	Part I	Language - Tamil/Hindi/ Malayalam/ French / Sanskrit	200	6
2.	Part II	English	200	6
3.	Part III	Core- Theory/Practical	2000	72
		Allied	400	20
		Electives/Project	300	15
4.	Part IV	Basic Tamil / Advanced Tamil / Non Major Elective	150	4
		Skill Based Subjects	300	9
		EDC	100	3
		Environmental Studies	50	2
		Value Education	50	2
5.	Part 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 are advised to complete a **SWAYAM-MOOC** before the completion of the 5th semester and the course completed certificate should be submitted to the HoD. Two credits will be given to the candidates who have successfully completed.
- A **Field Trip** preferably relevant to the course should be undertaken every year.

Components of Continuous Internal Assessment

Components		Marks	Total
Theory			
CIA I	75	(75 + 75 =150 / 10)	25
CIA II	75	15	
Assignment/Seminar		5	
Attendance		5	
Practical			
CIA Practical		25	40
Observation Notebook		10	
Attendance		5	
Project			
Review		15	20
Regularity		5	

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**-Understanding; **K3**-Apply; **K4**-Analyze; **K5**-Evaluate

1. Theory Examination - Part I, II &III

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

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	75
K2 Q11 to 15	B (Either or pattern)	5 x 5 = 25	Short Answers	
K3 & K4 Q16 to 20	C (Either or pattern)	5 x 8 = 40	Descriptive / Detailed	

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

Knowledge Level	Section	Marks	Description	Total
K1 Q1 to 10	A (Answer all)	10 x 1 = 10	MCQ	55
K2 Q11 to 15	B (Either or pattern)	5 x 3 = 15	Short Answers	
K3 & K4 Q16 to 20	C (Either or pattern)	5 x 6 = 30	Descriptive / Detailed	

2. Practical Examination:

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

3. Project Viva Voce:

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

19UCT101

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT101		**Core Paper 1 – C Programming**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	I	5	75	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. Familiarize the basic syntax and semantics of C Language.

Course Outcomes (CO)

K1	CO1	Recollect various programming constructs and to develop C programs.
K2	CO2	Understand the fundamentals of C programming.
K3	CO3	Choose the right data representation formats based on the requirements of the problem.
K4	CO4	Implement different Operations on arrays, functions, pointers, 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 Associatively. Managing Input and Output operations: Reading and Writing Character-Formatted Input – Formatted Output.

19UCT101

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:

Chalk and Talk, Presentation, Discussion and Assignment

19UCT101

TEXT BOOK:

1. E. Balagurusamy, (2011), Programming in ANSI C, Fifth Edition, Tata McGraw 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 McGraw Hill 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

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

19UCT1CL

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT1CL		**Core Practical 1 – C Programming Lab**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	I	5	75	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	CO1	Develop logical and programming skills using the fundamentals and basics of C Language.
K3	CO2	Develop programs using the control statements, Arrays and Strings
K4	CO3	Apply effective usage of arrays, structures, functions and pointers.
K5	CO4	Implement files and command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a Program to find the roots of a Quadratic Equation.
2. Write a program to find the greatest and smallest number from set of numbers.
3. Write a program to find the sum, average, standard deviation from set of numbers.
4. Write a program to find the given string is a palindrome or not.
5. Write a program to perform String functions
6. 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 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. Using function to carry out above tasks.
10. Write a generalized program to perform matrix operation.

11. Write a program to print the student's mark statement using Structure
12. Write a program to manipulate array elements using Pointers.
13. Write a program to display an image using graphics in C.
14. 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: 10 Marks

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Program Coding & Execution	15	15
Modifications	5	5

TEACHING METHODS:

Presentation and Program demonstration through Projector

MAPPING

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

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

19UCT202

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT202	**Core Paper 2 – Digital Logic and Circuit Designs**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	II	3	45	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.
4. To know the concept of Combination Circuits.
5. To learn the concept of Counters and Registers.

Course Outcomes (CO)

K1	CO1	Retain the information about the Computer Number systems and conversions in Digital Computer System
K2	CO2	Understand the concepts of Boolean expressions, Logic Gates and to apply the methods to simplifying the Boolean expression.
K3	CO3	Apply the knowledge to perform arithmetical operations using various logical circuits and to design various Synchronous and Asynchronous.
K4	CO4	Investigate the function Counters and Registers

SYLLABUS

UNIT I **9 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.

19UCT202

UNIT II **9 Hours**

Boolean Algebra and Minimization Technigues: 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 **9 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 **9 Hours**

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

UNIT V **9 Hours**

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

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion, Assignment

TEXT BOOK:

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

19UCT202

REFERENCE BOOKS:

1. Morris Mano, (2011), Digital Logic and Computer Design, Thirteenth impression, Tata McGraw Hill Publication. (UNIT I, II andIII)

2. Leach Malvnio, (2005), Digital Principles & Application , Fifth Edition, Tata McGraw HillPublication.

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

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

19UCT203

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT203		**Core Paper 3 – Object Oriented Programming with C++**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	II	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	CO1	Remember the characteristics of Procedure and Object Oriented Programming Languages
K2	CO2	Understand the fundamentals of C++ programming structure, function overloading and constructors.
K3	CO3	Using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
K4	CO4	Apply the concepts in 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

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

19UCT203

UNIT II **9 Hours**

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.

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

UNIT III **9 Hours**

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 – **Manipulators***.

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.

Templates: Class template-Class template with multiple parameter-Function template - Function template with multiple parameters.

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:

Chalk and Talk, Presentation, Discussion and Assignment

19UCT203

TEXT BOOK:

1. E.Balagurusamy, (2012), Object Oriented Programming with C++, Fifth Edition, Tata McGraw Hill Publication.

REFERENCEBOOKS:

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	PSO1	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

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

19UCT2CM

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT2CM		**Core Practical 2 – Object Oriented Programming with C++ Lab**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	II	4	60	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)

K3	CO1	Implement the concepts of object oriented programming.
K3	CO2	Apply string functions to perform operator overloading.
K4	CO3	Analyze virtual functions and inheritance.
K5	CO4	Implement files and command line arguments.

LIST OF PRACTICAL PROGRAMS

1. Write a C++ program to perform Friend function concept.
2. Write a C++ program to perform arithmetical operations using Constructor.
3. Write a C++ program to perform Banking operation using constructor.
4. Write a C++ program to perform function overloading and this pointer
5. Write a C++ program to perform Operator Overloading concept.
6. Write a C++ program to perform string manipulation operations
7. Write a C++ program to prepare employee pay slip using console I/O.
8. Write a C++ program to find Area and Perimeter using Virtual function ad Inheritance concept.
9. Write a C++ program to perform file manipulations.
10. Write a C++ program using Command Line Arguments.
11. Write a C++ program using Function and class template.
12. Write a C++ program using Exception Handling.

19UCT2CM

Guidelines to the distribution of marks for Practical Examinations:

Two Questions will be given for each student. (3 Hours/60 marks) Record: 10 marks

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Program Coding & Execution	15	15
Modifications	5	5

TEACHING METHODS:

Presentation and Program demonstration through Projector.

MAPPING

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

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

19UCT304

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT304		**Core Paper 4 – Advanced Operating Systems**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	III	5	75	4

Course Objectives

1. To learn the fundamentals of Operating Systems.
2. To understand the structure and organization of the file system, process management, CPU Scheduling and Memory Management.
3. To provide the design principles of Android operating system.

Course Outcomes (CO)

K1	CO1	Recollect the basic functionality of the salient features of operating systems like DOS history, Processing states, Interrupts and Switching concepts.
K2	CO2	Understand the concepts of storage management, paging and page replacement concepts.
K3	CO3	Apply various optimization techniques in operating systems.
K4	CO4	Analyze the functionalities of Android operating system.

SYLLABUS

UNIT I **15 Hours**

Introduction - what is an OS-Mainframe system-Desktop Systems-Multiprocessor systems-Distributed systems-Clustered systems-**Real-Time systems***. Operating system structures: System components-OS services-System calls.

UNIT II **15 Hours**

Process Management: Process concept -process scheduling-Operations on process – Cooperating Process-inter-process communication.CPU scheduling: Basic Concepts - Scheduling criteria-Scheduling algorithms-Multiple-processor Scheduling-Real-Time Scheduling

19UCT304

UNIT III **15 Hours**

Deadlocks: Deadlock characterization-Methods for handling Deadlocks- Deadlocks prevention-Deadlock avoidance-deadlock detection –Recovery from Deadlock. Memory management: Background-Swapping-Contiguous memory allocation- paging -segmentation-segmentation with paging.

UNIT IV **15 Hours**

Virtual memory: Demand paging-Process creation -Page replacement-Thrashing. I/O Systems: Disk structure-Disk scheduling –Disk management –**Swap Space management** *.File systems: File concepts-Access methods- Directory structure -File system structure-Directory implementation-Allocation methods-Recovery.

UNIT V **15 Hours**

Case Studies: Android- WAP-Open handset alliance-Android platform-Configure develop environment-SDK license agreement-Exploring the core android application framework-Android emulator-**Testing your development environment**-Building your first android application-Create and configure-Core files and directories-Launch configuration-Running.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOKS:

1. Abraham Silberschatz,Galvin,Gagne **- "Operating Systems Concepts**", Sixth Edition, John Wiley&sons, 2004.(Unit I – IV)
2. Lauren Darcey, Shane Conder, (2012), "**Android–Wireless Application Development**(Volume-I, Third Edition, Pearson Publication. (UnitV)

REFERENCE BOOKS:

1. Achyut S Godbole, (2006), Operating Systems, Tata MCGraw Hill Publication. 2.Jorg H.Kloss, (2013), Android Apps with APP Inventor ,Pearson Publication.

19UCT304

MAPPING

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

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

19UCT305

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT305	**Core Paper 5 – Data Structures and Analysis of Algorithms**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	III	5	75	4

Course Objectives

1. Describe and implement the advanced data structures and demonstrate Knowledge in different methods for representing a graph and tree.
2. Apply important algorithmic design paradigms and methods of analysis.
3. Analyze the asymptotic performance of algorithms.

Course Outcomes (CO)

K1	CO1	Remember the data structures algorithms and programs.
K2	CO2	Understand data structures and the concepts of algorithms for searching, sorting and dynamic programming
K3	CO3	Apply appropriate algorithms and data structures for various applications
K4	CO4	Analyze the computational complexity of various algorithms

SYLLABUS

UNIT I **15 Hours**

Introduction: Overview -How to create a program-How to analyze a program. Arrays: Axiomatization - Ordered Lists –Sparse Matrices-Representation of Arrays. Stacks and Queues: Fundamentals- Evaluation of Expressions-Multiple Stacks and Queues.

UNIT II **15 Hours**

Linked Lists: Singly Linked List-Linked Stacks and Queues–The Storage pool-Polynomial Addition-Doubly Linked Lists and Dynamic Storage Management.

Tress: Basic Terminology-Binary Trees-Binary Tree Representations-Binary Tree Traversal.

19UCT305

UNIT III **15 Hours**

Graphs: Terminology and Representations– Traversals, Connected Components and Spanning Trees -Shortest Paths and Transitive Closure.

Internal Sorting: Insertion Sort - Quick Sort – 2-Way Merge Sort - Heap Sort – Sorting on Several Keys.

External Sorting: Sorting with Tapes, Sorting with Disks.

UNIT IV **15 Hours**

Symbol Tables: Static Tree Tables - Dynamic Tree Tables - Hash Tables – Hashing Functions- Overflow Handling.

Files: Files, Queries and Sequential Organizations - Index Techniques – File Organizations.

UNIT V **15 Hours**

Introduction – Analysis of algorithms– Best case and worst case complexities, Analysis of some algorithms using simple data structures, amortized time complexity. Dynamic programming: The General Method – **Traveling sales Person problem***.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion and Assignment

TEXT BOOKS:

1. Ellis Horowitz, Sartaj Shani, (1994), Fundamentals of Data Structures, First Edition. Galgotia Publication. (Unit I to Unit IV)
2. Ellis Horowitz), Sartaj Sahni and Sanguthevar Rajasekaran, (2008), Fundamentals of Computer Algorithms, Second Edition, Hyderabad Universities Press (India) Private Limited Publication. (Unit V)

19UCT305

REFERENCE BOOK:

1. Robert Kruse, C.L. Jondo Bruce Leung, (1999), Data Structures and Program Design in C, Second Edition, Pearson Edition Asia Publication.

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

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

19UCT306

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT306		**Core Paper 6 – Advanced Java Programming**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	III	5	75	4

Course Objectives

1. To understand the difference between C, C++ and Java Programs.
2. To explore the Java Applications and to identify the variations between Stand alone java applications and Web based applications.
3. To provide the advanced concepts in java programming like Package, Multi Thread, Applet, interface and AWT Components
4. Ability to improve their programming skills using self programs.

Course Outcomes (CO)

K1	CO1	Remember the basic concepts of OOPs, Data Types, Control Statements and Tokens.
K2	CO2	Realize the knowledge about the java statements.
K3	CO3	Implement the concept of Package, Thread , Applet, Interfaces and AWT Components
K4	CO4	Inspect the java concepts and get the new innovative ideas.

SYLLABUS

UNIT I **15 Hours**

JAVA Evolution: OOPS Concept- History – Features – How Java differs from C and C++ - Java and Internet. Overview of Java Language: Introduction – Simple Java program – Structure – java Tokens – Statements- Scope of Variable-Datatypes– Operators- Class-Object- Method – Final –Static.

UNIT II **15 Hours**

Arrays- Strings-Inheritance: Introduction-Types of Inheritance.

Interfaces: Multiple Inheritances. Packages: Putting classes together- Multi Threaded Programming - Managing Errors and Exceptions

19UCT306

UNIT III **15 Hours**

Files: Introduction – Concept of Streams – Stream classes – I/O Exceptions – Reading/Writing characters /Bytes- Handling primitive data types – Random Access Files.

Applet programming–Graphics programming-Color-Font.

UNIT IV **15 Hours**

AWT – Introduction – AWTClasses – Container -Labels – PushButtons – CheckBoxs – ChoiceList – List - TextField -TextArea- ScrollBar- MenuBar.

Event Handling-ActionEvent-KeyEvent-MouseEvent-MouseWheelEvent-Item Event.

Interface-ActionListener-ItemListener-KeyListener-MouseListener-MouseMotionListener- -MouseWheelListener.

UNIT V **15 Hours**

Swing Concepts – Introduction- Component & Containers – Swing Packages – Jlabel – JTextField-JButton – JtabbedPane – JTree – J Table.

Java Beans – Introduction –Java Bean API- Simple Java Bean API.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOKS:

1. E.Balagurusamy, (2010), Programming with Java – A Primer, Fourth Edition, Tata McGrawHill Publication. (Unit I, II and III)
2. Patrick Naughton, (2006), Java Hand Book, Tata MCGraw Hill Publication. (Unit IV)
3. Herbert Schildt (2011), The Complete Reference Java, 7th Edition, TATA MCGraw Hill.

19UCT306

REFERENCE BOOKS:

1. Patrick Naughton, Herbert Schildt, (2008), The Complete Reference Java 2, Fifth Edition, Tata MCGraw Hill Publication.
2. C.Xavier, (2006), Programming with Java 2, First Edition, Scitech Publication.

MAPPING

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

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

19UCT3CN

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT3CN		**Core Practical 3 – Advanced Java Programming Lab**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	III	5	75	2

Course Objectives

1. To explore the knowledge in stand Alone java applications and web based Applications.
2. To understand the usage of Classes, Package, Interface, Multi Threading, Exception, Applet and AWT.
3. On successful completion of practical they will able to get the overall idea about java programming structure.

Course Outcomes (CO)

K3	CO1	Practice the concepts of OOPs, java control statements, data types and Tokens.
K4	CO2	Review the java package, interface, applet and AWT Components.
K5	CO3	Work out all the java unique statements through the programs.

LIST OF PRACTICAL PROGRAMS

1. Write a program to perform Stack Operation.
2. Write a java program to perform string functions using constructor and user defined package.
3. Write a java program to illustrate multiple inheritances.
4. Write a program to perform thread concept.
5. Write a program to illustrate exception concepts.
6. Write a program to illustrate Applet concepts.
7. Write a java program illustrates file concepts.
8. Write a program to perform inventory control using AWT components.
9. Write a java program to perform Mouse Event operations
10. Write a Java program to demonstrate the multiple selection listbox.
11. Write Java program to create a menu bar and pull down menus.

12. Write a program to illustrate Key Event operations.
13. Write a java program to perform student mark statement using swing concept.
14. Write a java program to design file explorer using JTree concept.
15. Write a java program to implement simple Java Bean Concept.

Guidelines to the distribution of marks for practical Examinations:

Two Questions will be given for each student. (3 Hours/60 marks) Record: 10 marks

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Program Coding & Execution	15	15
Modifications	5	5

TEACHING METHODS

Presentation and Program demonstration through Projector.

MAPPING

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

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

19UCT407

Programme Code : 11	**B.Sc Computer Technology**			
Course Code: 19UCT407	**Core Paper 7 – Relational Database Management Systems**			
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	IV	5	75	4

Course Objectives

1. To develop the knowledge in various Database concepts, queries, normalization and reports.
2. To be able to construct a new normalized database.

Course Outcomes (CO)

K1	CO1	Remember the basic concepts of database management systems and database techniques
K2	CO2	Understand Data constraints and CODDs rules, DML and DDL statements of ORACLE,
K3	CO3	Apply various DDL and DML statements, joins queries, PL / SQL statements.
K4	CO4	Analyze the granting and revoking permissions , cursors

SYLLABUS

UNIT I **15 Hours**

Introduction: Purpose of Database Systems - View of Data - Data Models - Database Languages - Database Administrator - Database Users. Entity Relationship Model: Basic concepts –Mapping Cardinalities - Entity Relationship Diagram- E-R Features - Relational Model: Structure of Relational Databases - Relational Algebra.

UNIT II **15 Hours**

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

19UCT407

UNIT III **15 Hours**

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

UNIT IV **15 Hours**

SQL: Nested Sub queries - Derived Relations – **Views** * - Joined Relations. Integrity Constraints: Domain Constraints- Referential Integrity - Assertions.

UNIT V **15 Hours**

Functional Dependencies - Relational Database Design: Pitfalls – Normalization-First Normal Form, Second Normal Form, Third Normal Form and BCNF.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOKS:

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

REFERENCE BOOKS:

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

19UCT407

MAPPING

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

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

19UCT408

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT408		**Core Paper 8 – .NET Framework**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	IV	4	60	4

Course Objectives

1. To design and develop the distributed event driven programming in both VB and .Net framework
2. To Apply CLR, .NET framework classes andADO.Net.
3. To Analyze the Properties, Events and Methods in .Net Environment.

Course Outcomes (CO)

K1	CO1	Remember the basic Visual basic concepts and advanced features of VB.Net.
K2	CO2	Understand the concepts of .Net framework Technology and summarize the advantages and disadvantages of .Net framework.
K3	CO3	Apply the web applications using VB.Net.
K4	CO4	Analyze the distributed event driven programming using .Net framework

SYLLABUS

UNIT I **12 Hours**

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

UNIT II **12 Hours**

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

19UCT408

UNIT III **12 Hours**

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

UNIT IV **12 Hours**

Web forms – Buttons, Test boxes, Labels, Literals, Place Holders, Check boxes, Radio buttons, Tables, Panels, Images, Image buttons, List boxes, Drop down lists, Hyperlinks and link buttons, **HTML controls***.

UNIT V **12 Hours**

Data Access with ADO.net – binding controls to database – database access with web applications – creating window services, web services and deploying applications.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

1. Steven Holzner, (2005), Visual Basic.NET Black Book, FirstEdition, Dream Tech Publication.

REFRENCE BOOKS:

1. Evangelos Petroustes, (2002), Mastering VisualBasic.NET, FirstEdition, BPB Publication.
2. Bill Evjen Beres, (2002), Visual Basic.NET programming Bible, Wiley – DreamTech Publication.

19UCT408

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

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

19UCT409

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT409		**Core Paper 9 – Computer Networks**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	IV	5	75	4

Course Objectives

1. To provide the concepts and fundamentals of different layers used in computer networking.
2. To understand a basic knowledge of the use of cryptography and different techniques keys used for Encryption and Decryption.

Course Outcomes (CO)

K1	CO1	Understand OSI reference Model and knowledge of using different Layers in the networking model.
K2	CO2	Understand the knowledge of the use of cryptography
K3	CO3	Apply the techniques used in routing algorithms
K4	CO4	Analyze Digital Signatures Symmetric-Key Signatures and Public-Key signatures.

SYLLABUS

UNIT I **12 Hours**

Introduction: Uses of computer networks-Network Hardware – Network Software – Reference Models.

UNIT II **15 Hours**

The Physical layer: Guided transmission media – Communication satellites – The Public Switched telephone network: Structure of the telephone system – The local loop : modems, wireless local loops – Switching-Cable Television-Community Antenna Television-Internet Over Cable.

19UCT409

UNIT III **16 Hours**

The Data link layer: Data link layer design issues **-**The Medium access control sub layer: The channel allocation problem – Multiple access protocols: **ALOHA*-**Carrier sense multiple access protocols, collision-free protocols, Limited-Contention protocols – 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 shortest path routing, distance vector routing, routing for mobile hosts, link state routing, hierarchical routing, broadcast routing and multicast routing.

The Transport layer: The Transport service: Services provided to the upper layers, transport service primitives, Berkeley sockets – Elements of Transport protocols.

UNIT V **16 Hours**

The Internet Transport Protoclos: UDP-Introduction to UDP-Remote Procedure Calls-TCP-Introduction to TCP- TCP Service Model .

The Application layer: DNS– Electronic mail- Architecture and services-User agent. Network Security: Cryptography – DES – RSA.

Digital Signatures: Symmetric-Key Signatures, Public-Key signatures.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

1. Andrew S. Tanenbaum, (2003), Computer Networks, Fourth Edition, Pearson Education Publication.

19UCT409

REFERENCE BOOKS:

1. Behrouz A. Forouzan, (2003), Data Communications And Network, Second Edition, Tata MCGraw Hill Publication.
2. William A shay, (2001), Understanding data communications and networks, Second Edition, Vikas Publication.

MAPPING

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

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

19UCT4CO

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT4CO		**Core Practical 4 – .Net Framework and Oracle Lab**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	IV	6	90	2

Course Objectives

1. To design and develop the applications using ADO.Net and session tracking.
2. To make the students to develop the database projects with a back end concept.
3. To construct .NET applications and to maintain the database.
4. To familiarize the students in crystal report creation.

Course Outcomes (CO)

K3	CO3	Apply the decision and control structures in .NET and apply the concepts of queries and creation of console applications.
K4	CO4	Analyze the concept of windows application and project creation and Oracle functions
K5	CO4	Execute the console, window application, crystal report, PL/SQL triggers.

LIST OF PRACTICAL PROGRAMS

. NET FRAMEWORK

1. Perform Matrix Multiplication using Arrays Concept in Console Application
2. Program to simulate a simple calculator in Windows Application.
3. Program to simulate a digital clock with reset option in Windows Application.
4. Program for a notepad application in Windows Application.
5. Program to maintain student details in Windows Application.
6. Design a website to display your bio-data usingASP.Net.
7. Design a website with login control usingASP.net
8. Develop a Simple Project for Hotel Management using VB.NET as front end and ORACLE as back end and create a Crystal report.

19UCT4CO

ORACLE

1. Create a student mark list and do the following
   - ✓ Alter the table to add total and average fields with required size.
   - ✓ Modify to increase the total field size.
   - ✓ Calculate the total and average.
2. Create two tables in the name Employee_Personaland Employee_Salary using Primary and Foreign key concept and perform necessary operations.
   - ✓ Display the employee details who are all getting salary above15000.
   - ✓ Display the employee name and address who are all coming from city "Coimbatore" or "Chennai".
   - ✓ Display the employee name ,who are all coming from city "Coimbatore" and pin code 641029 or641001.
   - ✓ Display the employee details in descending order based on name.
3. Create a table and perform the queries using comparison, logical, set, sorting and grouping operators.
4. Write necessary queries to perform oracle built-in functions.
5. Write PL/SQL block to prepare electricity bill.
6. Write PL/SQL block:
   - ✓ Find the sum of individual number.
   - ✓ Find the given number is Armstrong number or not.
7. Create a Data base Triggers to check the validity of records.
8. Write PL/SQL block to partition the details of the student into two tables.

19UCT4CO

Guidelines to the distribution of marks for practical Examinations:

Two Questions will be given for each student. (3 Hours/60 marks) Record: 10 marks

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Program Coding & Execution	15	15
Modifications	5	5

TEACHING METHODS

Presentation, Program demonstration through Projector.

MAPPING

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

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

19UCT4A4

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT4A4	**Allied Paper 4 – Computer System Architecture**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	IV	6	90	5

Course Objectives

1. To understand the basic architecture of computers and its registers.
2. To understand machine language, arithmetic and logic operations.
3. To be aware of the techniques used in input output devices and memory organization.

Course Outcomes (CO)

K1	CO1	Remember the basic architecture of computer.
K2	CO2	Understand the 16 bit memory and peripheral devices.
K3	CO3	Apply the concepts of I/O devices, memory organization.
K4	CO4	Analyze the development tools, I/O devices.

SYLLABUS

UNIT I **18 Hours**

Basic Computer Organization and Design : Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory-Reference Instructions – Input-Output and Interrupt – Design of Basic Computer – Design of Accumulator Logic.

UNIT II **18 Hours**

Programming the Basic Computer: Introduction – Machine Language – Assembly Language – The Assembler – Program Loops – Programming Arithmetic and Logic Operations – Subroutines – Input-Output Programming.

UNIT III **18 Hours**

Central Processing Unit: Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control – Reduced Instruction Set Computer(RISC).

19UCT4A4

UNIT IV **18 Hours**

Input-Output Organization: Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access – Input-Output Processor – **Serial Communication***.

UNIT V **18 Hours**

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion and Assignment

TEXT BOOK:

1. M.Morris Mano (2011), Computer System Architecture, 3rd Edition,Pearson.

REFERENCE BOOKS:

1. John P Hayes, (1998), Computer Architecture and Organization , Third Edition , McGraw Hill InternationalPublication.

MAPPING

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

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

19UCT510

Programme Code : 11	**B.Sc Computer Technology**			
Course Code: 19UCT510	**Core Paper 10 – Software Engineering and Testing**			
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	V	5	75	5

Course Objectives

1. To remember the methods and technologies involved in building complex software.
2. To understand the various steps involved in developing software including requirement elicitation, System design, object design and testing.
3. To implement the Software testing techniques in the projects.

Course Outcomes (CO)

K1	CO1	Remember the steps involved in developing the software.
K2	CO2	Understand the roles and responsibilities of various persons involved in development cycle.
K3	CO3	Implement the methods and techniques to develop a small project.
K4	CO4	Analyze the problems that may occur in each and every phase of software development cycle.

SYLLABUS

UNIT I **15 Hours**

Introduction – The evolving role of software – Software crisis – software myths – Software engineering technology – The software process – Software process models.

UNIT II **15 Hours**

Requirements engineering Tasks– Developing Use-Cases – Negotiating requirements – Validating requirements – Requirement analysis – Data modeling concepts – Flow oriented modeling .

UNIT III **15 Hours**

Design engineering –Design concepts – Data Design – Performing user interface Design : The golden rules - – Design heuristics for effective modularity.

19UCT510

UNIT IV **15 Hours**

Typesoftesting:Whiteboxtesting-BlackBoxTesting:What,HowtodoBlackboxtesting – Requirement based testing – Positive and Negative Testing – Boundary Value Analysis – Decision Tables – Equivalence partitioning – State Based or graphic Based Testing – Compatibility Testing – User Documentation – Domain Testing.

UNIT V **15 Hours**

Integrating Testing: Introduction - Integration Testing as a Type of Testing – Integration Testing as a phase Testing.

System and Acceptance Testing: Introduction – Functional Versus Non – Functional System Testing – Functional System Testing – Non - Functional System Testing - Acceptance Testing.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOKS:

1. Roger S Pressman, (2005), Software Engineering, Sixth Edition, TMH Publication. (UNIT I to UNITIII)
2. Srinivasan Desikan, Gopalaswamy Ramesh,(2008), Software Testing Principles and practices, Dorling Kindersely Publication. (UNIT IV , UNITV)

REFERENCE BOOKS:

1. Watts S Humphrey, (2008), A discipline for Software Engineering, First Edition, Pearson EducationPublication.
2. Ian Somerville, (2007), Software Engineering, Seventh Edition, Pearson Education Publication.

19UCT510

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

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

19UCT511

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT511		**Core Paper 11 – Wireless Ad-Hoc Network**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	V	5	75	5

Course Objectives

1. To introduce the basic concepts Wireless Ad-Hoc Network
2. To get knowledge about various concepts in wireless Ad-Hoc Network.
3. To provide an opportunity for students to understand the concept of Routing Protocols, Trust Management and Applications.

Course Outcomes (CO)

K1	CO1	Understand the concept configuration, Healing and self-Organize in Ad-Hoc Network.
K2	CO2	Understand various Routing protocols natures.
K3	CO3	Apply the various techniques used for Multicasting and Broadcasting.
K4	CO4	Analyze wireless Ad-Hoc Network Vehicular applications.

SYLLABUS

UNIT I **15 Hours**

Properties of Wireless Multihop Networks: Introduction-Terminology and Models –Data sampling and Simulation Methodology.

Self-Configuring, Self-Organizing and Self-Healing Scheme: Introduction-Hidden Terminal Problem-Self Configuring and Organizing MANETs-Self Healing.

Cooperation in mobile Ad-hoc network: Introduction-Virtual Currency System-Reputation System-CONFIDANT-CORE-OCEAN.

UNIT II **15 Hours**

Routing in Mobile Ad-hoc network: Introduction-Routing Protocol-Expected properties of MANET routing protocol – Categorizing the Routing Protocols for MANET-Proposed Protocols-Criteria for proposed evaluation of MANET routing protocols.

19UCT511

UNIT III **15 Hours**

Multicasting in mobile Ad-hoc network: Introduction-Design and considerations.

Broadcast in Ad-hoc network: Introduction –Heuristic Based broadcast-Neighbor coverage broadcast – Dominating sets based broadcast-Cluster based broadcast-Resource aware broadcast

UNIT IV **15 Hours**

Verification of routing protocols: Introduction – Formal verification techniques-Tools.
Security Threads in Ad-hoc Routing protocols: Introduction – Taxonomy of Ad-hoc network-Elements-Attack behavior-Attack scenarios

UNIT V **15 Hours**

Trust management in Mobile Ad-hoc network: Introduction-Security issues in MANET-Trust management system trust-Reputation-Components of Trust management system-Trust evaluation in Ad-hoc network.

Vehicular Ad-hoc networks-Applications and Networks Architecture.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

19UCT511

TEXT BOOK:

1. Sudip Misra, Isaac woungang,Subhas Chandra Misra(2009),The guide of Wireless Ad-hoc Network, Springer International Edition..

REFERENCEBOOKS:

1. Savo G. Glisic,"Advanced Wireless Networks", 3rd Edition,Wiley Publication.

2. Carlos de Morais Cordeiro and Dharma Prakash Agrawal"Ad Hoc and Sensor Networks: Theory and Applications". 2nd Edition, 2011

MAPPING

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

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

19UCT512

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT512	**Core Paper 12 – Data Mining and Warehousing**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	V	6	90	5

Course Objectives

1. To understand the different techniques in Data Mining and to develop the knowledge about Data Warehousing, Data Mining and KDD process.
2. To study the methodology of data warehousing and data mining to derive business rules for decision support systems.
3. To Describe and demonstrate the data mining algorithms and methods.

Course Outcomes (CO)

K1	CO1	Remember the basic concepts in database management system and understand the discovery of knowledge in databases.
K2	CO2	Understand the techniques of genetic algorithms, neural networks and decision trees.
K3	CO3	Apply clustering and classification algorithms in data mining.
K4	CO4	Analyze typical process flow within a data warehouse, Extract and load process, clean and transform data, Backup and archive process.

SYLLABUS

UNIT I **18 Hours**

Basic Data Mining Tasks -Data Mining Versus Knowledge Discovery in Databases –Data Mining Issues –Data Mining Matrices –Social Implications of Data Mining –Data Mining from Data Base Perspective.

UNIT II **18 Hours**

DataMiningTechniques–aStatisticalPerspectiveondatamining–SimilarityMeasures–Decision Trees –Neural Networks –Genetic Algorithms.

19UCT512

UNIT III **18 Hours**

Classification: Introduction –Statistical –Based Algorithms –Distance Based Algorithms – **Decision Tree*** –Based Algorithms –Neural Network Based Algorithms –Rule Based Algorithms –Combining Techniques.

UNIT IV **18 Hours**

Clustering: Introduction –Similarity and Distance Measures –Outliers-Hierarchical Algorithms- Association Rules: Introduction- Large Item Sets –Basic Algorithms –Parallel and Distributed Algorithms.

UNIT V **18 Hours**

Delivery process: Introduction – Data warehouse delivery method. System processes: Overview – typical process flow within a data warehouse – Extract and load process – clean and transform data – Backup and archive process – Query management process.

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOKS :

1. Margaret H.Dunbam, (2003), Data Mining Introductory and Advanced Topics, Pearson Education Publication. (UNIT I to UNITIV)
2. Sam Anahory, Dennis murray, (2007), Data warehouse in the real world – practical guide for building decision support system, Second Impresdsion, (UNITV)

19UCT512

REFERENCE BOOK:

1. Jiawei Han, Micheline Kamber, (2001), Data Mining Concepts and Techniques, Academic Press Publication.

MAPPING

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

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

19UCT5CP

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT5CP		**Core Practical 5 – Software Testing Lab**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	V	6	90	2

Course Objectives

1. To develop a web based application for the real time project.
2. To find bugs in the product or application and to expand effective reporting.

Course Outcomes (CO)

K3	CO1	Apply the principles of system and component testing.
K4	CO2	Analyze the strategies for generating system test cases.
K5	CO3	Evaluate the tools used in automation testing.

SYLLABUS

1. Write a program to create calculator using HTML and validate using Selenium IDE with test case.
2. Write a program to create image link using HTML and validate using Selenium IDE with test case.
3. Write a program to create a registration form using HTML and validate using Selenium IDE with test case.
4. Write a program to create a webpage to scroll the text in right, left, up and down directions using HTML and validate using Selenium IDE with test case.
5. Write a program to create company website using HTML and validate using Selenium IDE with test case.
6. Write a program to create department website using HTML and validate using Selenium IDE with test case.
7. Write a program to create a resume using HTML and validate using Selenium IDE with test case.
8. Write a program to create a web page for student mark list using JavaScript and validate using Selenium IDE with test case.

19UCT5CP

TEACHING METHODS:

Presentation and Program demonstration through Projector.

Guidelines to the distribution of marks for practical Examinations:

Two Questions will be given for each student. (3 Hours/60 marks) Record: 10 marks

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Test Case	5	5
Test Result	10	10
Modifications	5	5

MAPPING

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

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

19UCT613

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT613		**Core Paper 13 – PHP**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	VI	6	90	5

Course Objectives

1. To understand the basic concept of website requirements and to realize the basic requirements of PHP.
2. To learn the concepts of PHP and Data base through various PHP and SQL Statements.
3. After the completion of this course, Students will get the overall idea about PHP and SQL and able to get the knowledge about Web site development.

Course Outcomes (CO)

K1	CO1	Remember the basic web development requirements and PHP concepts.
K2	CO2	Grasp the PHP program flow, arrays, string and functions.
K3	CO3	Implement classes, Cookies, Sessions, OOPs and File concepts.
K4	CO4	Review the concepts of SQLite and PHP Statements.

SYLLABUS

UNIT I **18 Hours**

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT II **18 Hours**

Controlling Program Flow: Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

19UCT613

UNIT III **18 Hours**

WorkingwithArrays:StoringDatainArrays–ProcessingArrayswithLoopsandIterations –Using Arrays with Forms – Working with Array Functions – Working with Dates and Times. Using Functions and Classes: Creating User – Defined Functions – Creating Classes – Using Advanced OOP Concepts.

UNIT IV **18 Hours**

Working with Files and Directories: Reading Files – Writing Files – Processing Directories. Working with Databases and SQL: Introducing Databases and SQL- Creating and Populating a Database - Using PHP's SQLite Extension – Introducing SQLite – Retrieving Data – Adding or Modifying Data – Handling Errors –Using PHP's PDO Extension – Retrieving Data – Adding and Modifying Data –**Switching to a Different Database***.

UNIT V **18 Hours**

Working with XML : Introducing XML – XML Basics – Anatomy of an XML Document – Well-Formed and Valid XML – XML Parsing Methods* – XML Technologies – Simple XML and DOM Extensions.

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

TEACHING METHODS

Lecture, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

1. Vikram Vaswani, (2008), PHP – A Beginner's Guide, Tata McGraw–Hill Publication.

19UCT613

REFERENCE BOOKS:

1. Steven Holzner, (2007), The PHP Complete Reference, Tata McGraw–Hill Publication.

2. Steven Holzer (2005), Spring into PHP5, Addison Wesley Publication.

MAPPING

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

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

19UCT614

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT614		**Core Paper 14 – Information Security**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	VI	6	90	4

Course Objectives

1. To understand all aspects of cyber security including network security, computer security and information security.
2. To become information security professionals for the high-end jobs insecurity.

Course Outcomes (CO)

K1	CO1	Recollect the basic security concepts of the digital computer system.
K2	CO2	Understand the malicious codes and virus attachments of a file.
K3	CO3	Apply the security mechanisms, firewalls and intrusion detection systems in the computer field.
K4	CO4	Analyze different types of security flaws , Legal and Ethical issues in computer security.

SYLLABUS

UNIT I **15 Hours**

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

UNIT II **15 Hours**

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

19UCT614

UNIT III **15 Hours**

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

UNIT IV **15 Hours**

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

UNIT V **15Hours**

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

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

TEACHING METHODS:

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

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

REFERENCE BOOKS:

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

19UCT614

MAPPING

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

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

19UCT6CQ

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT6CQ		**Core Practical 6 – Programming Lab-PHP**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	VI	6	90	2

Course Objectives

1. To be able to get the knowledge about platform independent language.
2. To get the idea about PHP and SQL connectivity concepts.
3. To be able to design their own website.

Course Outcomes (CO)

K3	CO1	Execute array functions, file and directory functions, date and time functions in PHP Script.
K4	CO2	Inspect PHP expressions, Cookies and Sessions.
K5	CO3	Evaluate the database using PHP's MySQLite extensions

LIST OF PRACTICAL PROGRAMMES

1. Develop a PHP program using controls and functions.
2. Develop a PHP program and check message passing mechanism between pages.
3. Develop a PHP program using String function and Arrays.
4. Develop a PHP program to display student information using MYSQL table.
5. Develop a PHP program to design a college application form using MYSQL table.
6. Develop a PHP program using parsing functions (useTokenizing).
7. Develop a PHP program and check Regular Expression, HTML functions, Hashing functions.
8. Develop a PHP program and check File System functions, Network functions, date and time functions.
9. Develop a PHP program using session.
10. Develop a PHP program using cookie and session.

19UCT6CQ

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

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Program Coding & Execution	15	15
Modifications	5	5

TEACHING METHODS

Presentation and Program demonstration through Projector.

MAPPING

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

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

19UCT6Z1

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT6Z1		**Core Project – Project Work & Viva - Voce *****		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	VI	4	60	5

Course Objectives

On successful completion of all the above courses

1. To be able to get 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 confident for implementing the task.
4. After completing their project they get the confident for solving the real time problems.

Course Outcomes (CO)

K3	CO1	Apply the programming skill for solving the project.
K4	CO2	Analyze the task and to collect the necessary information and software.
K5	CO3	Evaluate the task based on the software.

Guidelines to the Distribution of Marks:

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

19UCT6Z1

MAPPING

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

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

Programme Code : 11	**B.Sc Computer Technology**		
Elective Paper: Web Development Languages			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	6	90	5

Course Objectives

1. To get knowledge about Web development related Languages
2. To understand HTML, DHTML tags
3. To get an idea about scripting languages for web development

Course Outcomes (CO)

K1	CO1	To recollect basic concept about web technologies
K2	CO2	Understand the idea web development tools.
K3	CO3	Implement various HTML, DHTML and CSS Concepts.
K4	CO4	Evaluate scripting languages syntax for web Developments.

SYLLABUS

UNIT I **19 Hours**

Introduction to the Internet: Computers in Business – Networking – Internet – Emails – Resource Sharing – WWW – Usenet – Telnet

Internet Technology: Modem – Internet Address – Physical Connection

Introduction to HTML: History – HTML Generations – HTML Documents

Head Section: Title –links – color – **Comment Lines*.**

Body Section: Heading –Alignment – Horizontal Rule – Formatting Tags – Images – Anchor Tag – Order and Unordered Lists.

UNIT II **17 Hours**

Html Tables – Introduction – Table Properties – Frames – HTML forms – Method Attributes – Drop Down List.

DHTML: -Introduction – Object Reference – Event Model – Onclick – onload – Mouse Event – onfocus – onblur – onsubmit- onreset.

UNIT III **18 Hours**

CSS(Cascading Style Sheets) : Introduction – Inline CSS – Embedded CSS – External CSS- Positioning Elements – Background – Text flow – Box Model – User Style Sheet.

Java Script: History – Understand basic Terminology – variable- Execute Code – Repeat Statements – Comment –Handle Error – Exception.

UNIT IV **18 Hours**

Java Script Arrays: Creating an Empty Array – Length-Static and Dynamic - Types

Java script Function: Function Definition – Accept Parameter – Variable Scope – Return Value.

Java Script Classes : Built in classes and Data Type –String Objects – Mathematical Function – **Number Function***.

UNIT V **18 Hours**

VB Script – Scripting – VB Script – Data types – inserting script in HTML document- client side and server side script – converting variable types – operators – Date and Time function – Math function – Program Control Statement.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion and Assignment

TEXT BOOKS:

1. C. Xavier (2008), World Wide Web Design with HTML, Tata MCGraw Hill,12th Reprint (HTML)
2. Deitel & Deitel, GoldBerg(2005), Internet and World Wide Web-How to program ", Prentice Hall of India Pvt Ltd., Third Edition (DHTML and CSS)
3. Scott Dutty(2006), Java Script A Beginners Guide, Dream Tech Press (Java Script)
4. D.P. Nagpal(2010) ,"Web Design Technology", S.chand and Company Ltd (VB Script)

REFERENCE BOOKS:

1. Thomas A.Powell (2004) ,"The Complete Reference HTML and XHTML", Tata McGraw Hill publication, FourthEdition, 2004.
2. Ralph Moseley (2007), Developing Web Applications , Wiley India Edition 1st Edition.

MAPPING

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

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

Programme Code : 11	**B.Sc Computer Technology**		
Elective Paper: Cloud Computing			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	6	90	5

Course Objectives

1. To understand the basic knowledge about the cloud computing techniques and architecture.
2. To gain knowledge of cloud services and cloud security.
3. To be able to understand Cloud Segment, Cloud Deployment Models and key cloud companies.

Course Outcomes (CO)

K1	CO1	Identify the architecture and infrastructure of cloud computing including SaaS, PaaS, IaaS, public cloud, private cloud, and hybrid cloud.
K2	CO2	Understand the core issues of cloud computing, security, privacy, and interoperability.
K3	CO3	Apply the appropriate technologies and approaches for the related issues in Cloud Computing.
K4	CO4	Analyze the suitable cloud computing solutions and recommendations according to the applications used.

SYLLABUS

UNIT I **18 Hours**

Introduction - cloud computing at a glance – Historical development – Building cloud computing environment.

UNIT II **18 Hours**

Principles of parallel and distributed computing – Eras of computing – parallel Vs distributed computing – Elements of parallel computing – Elements of distributed computing – Technologies for distributed computing.

UNIT III **18 Hours**

Cloud computing architecture: Introduction – Cloud reference model – Types of clouds – Organizational aspects.

UNIT IV **18 Hours**

Cloud Applications: Scientific applications: Healthcare – Business and Consumer Applications: CRM and ERP – Media Applications – **Multiplayer Online gaming*.**

UNIT V **18 Hours**

Cloud Security – Cloud Computing Concept – Cloud Risk – Cloud Security Tools and Techniques – Data Production in Cloud – Cloud Storage – Data Loss Prevention – Cloud Application Security – Security Assertion Markup Language.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion and Assignment

TEXT BOOKS:

1. Rajkumar Buyya, Christian vecchiola , Thamarai selvi, (2013), Mastering Cloud computing, Mc Gram Hill Publication. (UNIT – I to UNIT –IV)

2. Charles P.Pfleeger, Shari Lawrence Pfleeger, Deven N.Shan, (2007), Security in Computing, Fourth Edition, Prentice Hall Publication. (UNIT –V)

REFERENCE BOOK:

1. Judith Hurwitz, Robin Bloon, (2009), Cloud Computing for Dummies

MAPPING

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

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

Programme Code : 11	**B.Sc Computer Technology**		
Elective Paper: Digital Image Processing			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	6	90	5

Course Objectives

1. To understand the basic fundamental concept of an image
2. To know the concepts of Image techniques, Sharpe and filtering ideas
3. To gain the knowledge about image patterns, structures and image compressions

Course Outcomes (CO)

K1	CO1	To remember the basic image concepts.
K2	CO2	To know the image sharpens enhancement and compression models.
K3	CO3	To apply various image techniques like edge linking and boundary detection.
K4	CO4	To analyze basic requirements of image processing like structure, compression and resolution.

SYLLABUS

UNIT I **18 Hours**

Digital Image Fundamentals: Image formation, Image transforms – Fourier transforms, Walsh, Hadamard, Discrete cosine, Hostelling transforms.

UNIT II **18 Hours**

Image Enhancement and Restoration: Histogram modification techniques - Image smoothening – Image sharpening - Image restoration - Degradation model – Noise models- Spatial filtering – **Frequency domain filtering***.

UNIT III **18 Hours**

Image Compression and Segmentation: Compression Models - Elements of information theory - Error free compression - Image segmentation – Detection of discontinuities - Edge linking and boundary detection – Thresholding – Region based segmentation - Morphology.

UNIT IV **18 Hours**

Representation and Description: Representation schemes – Boundary descriptors – Regional descriptors –**Relational descriptors***.

UNIT V **18 Hours**

Object Recognition and Interpretation: Patterns and pattern classes - Decision - Theoretic methods -Structural methods.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

1.Gonzalez, R.C., Woods, R.E., "Digital Image Processing", 2nd Edition, Pearson Education ,2002.

REFERENCE BOOKS:

1. Anil Jain, K., "Fundamentals of Digital image Processing" , Prentice all of India, 1989.
2. Sid Ahmed, "Image Processing",McGraw Hill, New York, 1995.

MAPPING

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

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

Programme Code : 11	**B.Sc Computer Technology**		
Elective Paper: Embedded Systems			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	6	90	5

Course Objectives

1. To understand the basic concept of Embedded System
2. To get knowledge about networks, serial and parallel port and protocols
3. To introduce real-time systems and embedded computing systems

Course Outcomes (CO)

K1	CO1	To remember basic concepts of Embedded System, Microcontroller, Ports and embedded programming in C,C ++and Java
K2	CO2	To understand the concepts internal architecture and interfacing of different peripheral devices with Microcontrollers
K3	CO3	To deploy in depth knowledge in Device drivers and Interrupts servicing mechanism, inter-process communication and synchronization of processes
K4	CO4	To analyze a vast experience about Real Time Operating Systems and its applications and program modeling concepts in a single and multi processor systems

SYLLABUS

UNIT I **18 Hours**

Introduction to Embedded System: Embedded System –Processor Embedded into the System –Embedded Hardware units and Devices in a System –Embedded Software in a system – Examples of embedded system –Embedded system on chip and use of VLSI circuit - Classification of embedded systems –**Skills required for an embedded System Designer*.**

UNIT II **18 Hours**

Devices and buses for device networks: I/O Types and Examples –Serial Communication devices: Synchronous, ISO-Synchronous and Asynchronous communication from serial devices –Parallel Device Ports -Timer and counting devices –Watchdog timer –**Real time clock***–Network Embedded Systems –Serial Bus Communication Protocol.

UNIT III **16Hours**

Device drivers and Interrupts servicing mechanism: Device drivers –Interrupt servicing mechanism –Context and the periods for context-switching, dead-line and interrupt latency – Device Driver Programming: –Parallel port device drivers –Serial port device drivers – Device drivers for IPTD.

UNIT IV **18 Hours**

Programming concepts and embedded programming in C and C++: Embedded programming in C++ and in Java. Program modeling concepts in single and multi processor systems: Program Models –DFG Models –State Machine Programming Models for Event-controlled Program Flow –Modeling of Multiprocessor Systems.

UNIT V **18Hours**

Inter –process communication and synchronization of processes. Tasks and threads: Multiple processes in an application –Multiple Threads Shared Data –Inter process communication. Real time operating systems: Operating system services –I/O subsystem–Real time operating systems –Basic Design using RTOS –RTOS Task scheduling Models, Interrupt Latency and Response of the Tasks as Performance Metrics.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

1. Raj Kamal, (2011), "Embedded Systems –Architecture, Programming and Design", 2ndEdition, TMH.

REFERENCE BOOKS:

1.Daniel W. Lewis, (2007), "Fundamentals of EmbeddedSoftware",1stEdition, PHI Education Publications.

2.Shibu K V,(2009),"Introduction to Embedded Systems",1stEdition,McGraw Hill Education.

MAPPING

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

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

Programme Code : 11	**B.Sc Computer Technology**		
Elective Paper: Principles of Data Science			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	6	90	5

Course Objectives

1. This course provides the fundamental concepts in data science.
2. It includes Data Classification, Sources of Data, Data Science user- roles and skills,.
3. Process of big data technology, Security and Intelligence, Basics of R and statistical measures.

Course Outcomes (CO)

K1	CO1	Understand data classification, process of big data technology, user roles and skills in data science.
K2	CO2	Apply the fundamental concepts and techniques of data science in 360 view of Customer
K3	CO3	Analyze the methodologies of data science
K4	CO4	Detect myths in big data

SYLLABUS

UNIT I **18Hours**

Data Evolution: Data Development Time Line – ICT Advancement-a Perspective – Data Growth-a Perspective – IT Components-Business Process – Landscape-Data to Data Science.

UNIT II **18Hours**

Understanding data: Introduction – Type of Data: Numeric – Categorical – Graphical – High Dimensional Data — Data Classification – Hot Data – Cold Data – Warm Data – Thick Data – Thin Data - Classification of digital Data: Structured, Semi-Structured and Un-Structured. Sources of Data: Time Series – Transactional Data – Biological Data – Spatial Data – Social Network Data – Data Evolution – **Data Sources***

UNIT III **18Hours**

Data Science: Data Science-A Discipline – Data Science vs Statistics, Data Science vs Mathematics, Data Science vs Programming Language, Data Science vs Database, Data Science vs Machine Learning. Data Analytics - – Relation: Data Science, Analytics, Big Data Analytics. Data Science.

Components: Data Engineering, Data Analytics-Methods and Algorithm, Data Visualization

UNIT IV **18Hours**

Big Data: Digital Data-an Imprint: Evolution of Big Data – What is Big Data – Sources of Big Data. Characteristics of Big Data 6Vs – Big Data Myths - Data Discovery-Traditional Approach, Big Data Technology: Big Data Technology Process – Big Data Exploration - Data Augmentation – Operational Analysis – **360 View of Customers *** – Security and Intelligence

UNIT V **18Hours**

Big Data Use cases –Big Data Technology Potentials – Limitations of Big Data and Challenges- Big Data Roles Data Scientist , Data Architect, Data Analyst – Skills – Case Study : Big Data – Customer Insights – Behavioral Analysis – Big Data Applications - Marketing – Retails – Insurance – Risk and Security – Health care.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOKS :

1. V. Bhuvaneswari, T. Devi, “Big Data Analytics: A Practitioner’s Approach” 2016.
2. Han Hu, Yonggang Wen, Tat-Seng, Chua, Xuelong Li,“Toward Scalable Systems for BigData Analytics: A Technology Tutorial”, IEEE, 2014.

REFERENCE BOOK:

1. Nina Zumal, John Mount (2014). Practical Data science in R, Managing Publication Company 2. Bernard Kolman, Robert C. Busby and Sharon Ross (2004). Discrete Mathematical Structures, New Delhi: Prentice Hall

MAPPING

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

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

Programme Code : 11	**B.Sc Computer Technology**		
Elective Paper: Artificial Intelligence			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	6	90	5

Course Objectives

1. To understand the basic concepts of Artificial Intelligence (AI) and identify the AI problems and domains.
2. To provide search techniques to solve the problems.
3. To represent and access the domain specific knowledge.

Course Outcomes (CO)

K1	CO1	Understand the nature of AI problems and task domains of AI.
K2	CO2	Apply the appropriate search procedures to solve the problems by using best algorithms.
K3	CO3	Analyze and select the suitable knowledge representation method.
K4	CO4	Manipulate the acquired knowledge and infer new knowledge.

` **SYLLABUS**

UNIT I **18 Hours**

Introduction: AI Problems - AI techniques - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems - Problem Characteristics - Issues in design of Search.

UNIT II **18 Hours**

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First Search – OR Graphs – A* Algorithm - Problem Reduction – AND-OR Graph – AO* Algorithm, Constraint Satisfaction, Means-ends analysis.

UNIT III **18 Hours**

Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

UNIT IV **18 Hours**

Using Predicate logic: Representing simple facts in logic - Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction.

UNITV **18 Hours**

Representing knowledge using rules: Procedural Vs Declarative knowledge – **Logic programming – Forward Vs Backward reasoning** * – Matching – Control knowledge.

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

TEACHING METHODS

Chalk and Talk, Presentation, Seminar, Discussion & Assignment

TEXT BOOK:

1. Elaine Rich and Kelvin Knight, (1991), Artificial Intelligence, Tata McGraw Hill Publishers company Pvt Ltd, Second Edition, (chapters 1-6 only).

REFERENCE BOOKS:

1. George F Luger, (2002), Artificial Intelligence, Fourth Edition, Pearson Education Publ.

2. V.S.Janakiraman and K.Sarukesi, (2001), Foundations of AI and Expert System, Mac Milan India Ltd.

MAPPING

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

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

19UCT3S1

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT3S1	**Skill Based Subject 1 – Programming Language in Python**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	III	2	30	3

Course Objectives

1. To understand the fundamentals of Python Programming.
2. To get knowledge about the Functions in Python.
3. To understand the concepts of List and String methods.
4. To gain idea about exception handling and classes.

Course Outcomes (CO)

K1	CO1	To implement basic concepts of operators and functions.
K2	CO2	To Review various string, list, tuple and dictionaries.
K3	CO3	To evaluate the functionality of anexception handling.
K4	CO4	To analyze the concept of classes and objects.

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.

19UCT3S1

UNIT III **6 Hours**

Functions: Introduction – Built-in Functions – Composition of Functions – User defined Functions – Parameters and Arguments –Function Calls- The return statement – Python Recursive Functions – The Anonymous function – Writing Python Scripts.

UNIT IV **6 Hours**

Strings and Lists: Strings - Lists. Tuples and Dictionaries: Tuples – Dictionaries.

UNIT V **6 Hours**

Files and Exceptions: Text Files – Directories – Exceptions – Exceptions with Arguments- User defined Exceptions- Classes and Objects.

TEXT BOOK:

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

REFERENCE BOOKS:

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

MAPPING

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

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

19UCT4SL

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT4SL	**Skill Based Subject 2– Python Programming Lab**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	IV	2	30	3

Course Objectives

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

Course Outcomes (CO)

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

LIST OF PRACTICAL PROGRAMMES

1. Write a python program to print the prime numbers in given range.
2. Write a python program to calculate the area of a triangle.
3. Write a python program to find HCF of the given numbers.
4. Write a python program to create a simple calculator.
5. Write a python program to display Fibonacci series sequence using recursion.
6. Write a python program to demonstrate the string methods.
7. Write a python program to demonstrate the built-in list methods.
8. Write a python program to define a function that prints a tuple whose values are the cube of numbers between 1 1nd 10.
9. Write a python program to demonstrate exception handling.
10. Write a python program to demonstrate classes and their attributes.

19UCT4SL

Guidelines to the distribution of marks for practical examinations:

Two questions will be given for each student (3 Hours/60 Marks) Record – 10 Marks

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

TEACHING METHODS

Presentation and Program demonstration through Projector.

MAPPING

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

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

19UCT5X1

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UCT5X1	**Extra Departmental Course - Web Development and Google App Lab**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	V	2	30	3

Course Objectives

1. To understand the knowledge about web development languages.
2. To gain knowledge about Website creation.
3. To get knowledge about various Google Applications.

Course Outcomes (CO)

K3	CO1	Implement various HTML tags and developing web pages.
K4	CO2	Review different HTML tags and its usages.
K5	CO3	Assess various Google Applications and its benefits

LIST OF PRACTICAL PROGRAMMES

1. Design a small webpage using formatting tags.
2. Design a webpage and display images.
3. Create a web page and display your Qualification using Tables.
4. Create User authentication page.
5. Design a Webpage and display the Biodata.
6. Create your department website.
7. To perform various operations using Google Doc
8. To perform various operations using Google Sheet
9. To prepare slide using Google Slides
10. To prepare online Feedback using Google forms

19UCT5X1

Guidelines to the distribution of marks for practical examinations:

Two questions will be given for each student (3 Hours/60 Marks) Record – 10 Marks

Particulars	Program1 (Marks)	Program2 (Marks)
Algorithm	5	5
Coding and Result	15	15
Modifications	5	5

TEACHING METHODS

Presentation and Program demonstration through Projector.

MAPPING

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

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

19UCT6SM

Programme Code : 11		**B.Sc Computer Technology**		
Course Code: 19UCT6SM		**Skill Based Subject 3 – Hardware Installation and Networking Lab**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	VI	2	30	3

Course Objectives

1. To understand the knowledge about the hardware components and troubleshooting
2. To get the knowledge about hardware assembling.
3. To understand the knowledge about LAN connectivity and network file sharing.

Course Outcomes (CO)

K3	CO3	Apply the computer trouble shooting mechanism.
K4	CO4	Analyze the LAN connectivity.
K5	C05	Execute the network file sharing.

LIST OF PRACTICAL PROGRAMS

1. Study of different components of a PC assembly.
2. Study of printer troubleshooting.
3. Study of shut downing the remote host with alert message.
4. Study of LAN connectivity in the environment.
5. Study on network file sharing.

Guidelines to the distribution of marks for Practical Examinations:

One Question will be given for each student. (3 Hours/60 marks) Record : 10 marks

Particulars	**Program1 (Marks)**
Procedure	20
Assembling and Troubleshooting	30

19UCT6SM

TEACHING METHODS:

Presentation and Program demonstration through Projector.

MAPPING

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

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

19EVS101

Programme Code : 11	**B.Sc Computer Technology**			
Course Code: 19EVS101	**Part – IV - Environmental Studies**			
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	I	2	30	2

Course Objectives

1. To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
2. To shape students into good "eco citizens" thereby catering to global environmental needs.

UNIT I MULTIDISCIPLINARY NATUREOFENVIRONMENT 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 ANDITS 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

19EVS101

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 ANDTHEENVIRONMENT **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, (2004), A Text Book of Environmental Studies, First Edition, Environmental Agency Publication.

REFERENCE BOOKS:

1. Purohit Shammi Agarwal, A text Book of Environmental Sciences, Saraswati Prohit Publication.
2. Dr.Suresh, K.Dhameja, Environmental Sciences and Engineering, S.K.Kataria & Sons Publication.
3. J.Glynn Henry, Gary W Heinke, Environmental Science and Engineering, Prentice Hall of India Private Ltd Publication.

19EVS101

Question Paper Pattern (External only)

Duration:3hours Total Marks : 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

19VED201

Programme Code : 11	**B.Sc Computer Technology**			
Course Code: 19VED201	**Part – IV – Value Education -Moral and Ethics**			
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	II	2	30	2

Course Objectives

1. To impart the value education in every walk of life.
2. To make them understand the relationship between Moral and Ethics.
3. To impart the right attitude by practicing self introspection.
4. To make them realize about their hidden power within them.
5. To develop a knowledge for the steps of upliftment.
6. To know about their goal oflife.
7. To make them understand the importance of yoga and meditation.
8. To realize what is the real peace.
9. To understand what are the ways to contribute peace to the whole world.
10. To goad youth to reach excellence and reap success.

SYLLABUS

UNIT I **6 Hours**

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

UNIT II **6 Hours**

Swami Vivekananda – A Biography.

UNIT III **6 Hours**

The Parliament of Religions – Teachings of Swami Vivekananda.

UNIT IV **6 Hours**

Steps for Human Excellence.

UNIT V **6 Hours**

Yoga & Meditation.

19VED201

TEXT BOOK:

1. Value Base Education, (2015), Moral and Ethics, First Edition, Published by Kongunadu Arts and Science College (Autonomous).

REFERENCE BOOK:

1. (2000), Easy steps to Yoga by Swami Vivekananda, A Divine Life SocietyPublication.

Question Paper Pattern (External only)

Duration:3hours Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type,

either or type questions from each unit.

19UHR3N1

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UHR3N1	**Non- Major Elective - I Human Rights**

Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	III	2	30	2

Course Objectives

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

SYLLABUS

UNITI **6 Hours**

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

UNITII

6 Hours

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

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

UNITIII **6 Hours**

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

19UHR3N1

UNIT IV **6 Hours**

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

UNIT V **6 Hours**

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

TEXT BOOK:

1. Human Rights (2019) Published by Kongunadu Arts and Science College, Coimbatore –29.

REFERENCE BOOK:

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

Question Paper Pattern
(External only)

Duration: 3 hrs 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

19UWR4N2

Programme Code : 11	**B.Sc Computer Technology**
Course Code: 19UWR4N2	**Non- Major Elective - II Women's Rights**

Batch	Semester	Hours/Week	Total Hours	Credits
2019-2020	III	2	30	2

Course Objectives

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

SYLLABUS

UNITI **6 Hours**

Women Studies:

Basic concepts of Women's studies in Higher education, Women's studies perspectives - Socialisation- 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**

Womens' 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.

19UWR4N2

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.

UNITV **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.

BOOK FOR STUDY:

1. Women's Rights (2019) Published by Kongunadu Arts & Science College, Coimbatore – 641 029

REFERENCES 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.

19UWR4N2

Question Paper Pattern

(External Only)

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

Section A (5 x 5=25)

Short notes

Either – or / type – question from each unit.

Section B (5 x 10=50)

Essay type

Either – or / type – question from each unit.

Programme Code : 11	B.Sc Computer Technology		
Non- Major Elective – Consumer Affairs			
Batch	**Hours/Week**	**Total Hours**	**Credits**
2019-2020	2	30	2

Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards.
3. To have a handle the business firms' interface with consumers and the consumer related regulatory and business environment.

Course Outcomes (CO)

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

SYLLABUS

UNITI **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

UNITII **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.

UNITIII **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.

UNITIV **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

UNITV **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, 1986. Any change in law would be added appropriately after the new law is notified.

SUGGESTED READINGS:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, 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, 1986 and its later versions.

MAPPING

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

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

Question paper pattern (External Only)

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

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.