

KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE – 641 029



DEPARTMENT OF COMPUTER SCIENCE

CURRICULUM AND SCHEME OF EXAMINATIONS (CBCS)

(2018 - 2019 and 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 SCIENCE

Vision:

To inculcate Human, Moral and ethical values in the young minds of the students and thereby improving the total personality of the students.

Mission:

- To produce employable graduates to cater the needs of various industries.

PROGRAMME OUTCOMES (PO)

- PO1** Understand the basic concepts, fundamental principles and scientific theories that are needed for higher learning and research.
- PO2** Identify, formulate and analyze the complex situations to arrive acceptable solutions by applying domain specific knowledge, acquired through the programme.
- PO3** Learn moral and ethical values and commit to professional ethics and responsibilities in the associated disciplines. Exercise social concern with the ability to act with awareness of issues in diversified domains to participate in the national development.
- PO4** Ability to design, implement and evaluate a computational system to meet the desired needs within realistic constraints.
- PO5** Realize the need for self and life-long learning to move along with the scientific and technological developments.
- PO6** Ability to communicate and engage effectively with diverse stakeholders.
- PO7** Analyze the impacts of computing on individuals, organizations and society.
- PO8** Acquire skills of observing and drawing logical inferences from the scientific facts.

PROGRAMME SPECIFIC OUTCOMES (PSO)

- PSO1** Impart the core knowledge in the areas such as Software Engineering, Data Communication, Networking and Security, Database Management, Web Technology, Operating System, Artificial Intelligence and other emerging areas in Computer Science.
- PSO2** Provide well trained professionals to industries by enhancing the programming skills and new computing technologies through theoretical and practical knowledge.
- PSO3** Train to solve real world problems by selecting appropriate techniques and best logic.
- PSO4** Enhance the ability to design and develop software applications, to understand the basic concepts of hardware and to comprehend and apply mathematical and accounting principles.
- PSO5** Make use of Computer Science techniques to one's own work as a member or a leader in a team to arrive conclusions and carryout projects.

KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
COIMBATORE - 641 029.

B.Sc. COMPUTER SCIENCE
Curriculum and Scheme of Examination under CBCS

(APPLICABLE TO STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2018-2019 & Onwards)

Semester	Part	Subject code	Title of the Paper	Instruction Hours / Cycle	Exam. Marks			Duration of Exam.(hours)	Credits
					CIA	ESE	Total		
I	I	18TML1A1	Language 1@	6	25	75	100	3	3
	II	18ENG101	English I	6	25	75	100	3	3
	III	18UCS101	C.P.1 – COBOL Programming	4	25	75	100	3	4
		18UCS1CL	C.Pr.1 – COBOL Programming - Lab	6	40	60	100	3	2
		18UCS1A1	Allied 1 –Discrete Mathematics and Statistics	6	25	75	100	3	5
	IV	18EVS101	Environmental Studies **	2	-	50	50	3	2
	Total Instruction Hours				30			550	
II	I	18TML2A2	Language II@	6	25	75	100	3	3
	II	18ENG202	English II	6	25	75	100	3	3
	III	18UCS202	C.P.2 - C Programming	4	25	75	100	3	4
		18UCS2CM	C.Pr.2 – C Programming - Lab	6	40	60	100	3	2
		18UCS2A2	Allied 2 –Operations Research	6	25	75	100	3	5
	IV	18VED201	Value Education – Moral and Ethics **	2	-	50	50	3	2
	Total Instruction Hours				30			550	
III	III	18UCS303	C.P.3 - Computer Organization and Architecture	5	25	75	100	3	4
		18UCS304	C.P.4 – Database Management System	5	25	75	100	3	4
		18UCS305	C.P.5 -Object Oriented Programming with C++	5	25	75	100	3	5
		18UCS3CN	C.Pr.3 – Object Oriented Programming with C++ - Lab	6	40	60	100	3	2
		18UCS3A3	Allied 3 –Business Accounting	5	25	75	100	3	5
	IV	18UCS3S1	Skill Based Subject 1- (Web Programming - HTML, CSS, XML)	2	25	75	100	3	3
		18TBT301 / 18TAT301 / 18UHR3N1	Basic Tamil */ Advanced Tamil **/ Non-Major Elective 1**	2	—	75	75	3	2
	Total Instruction Hours				30			675	

UCS 2

IV	III	18UCS406	C.P.6 – Operating Systems	5	25	75	100	3	4
		18UCS407	C.P.7 – Data Structures	5	25	75	100	3	4
		18UCS408	C.P.8 – Visual Basic and Oracle	5	25	75	100	3	5
		18UCS4CO	C.Pr.4 – Visual Basic and Oracle Lab	6	40	60	100	3	2
	18UCS4A4	Allied 4 –Microprocessors, PC – Hardware and Interfacing	5	25	75	100	3	5	
	IV	18UCS4SL	Skill Based Subject 2 - (Web Programming Lab - HTML, CSS, XML)	2	40	60	100	3	3
		18T BT402 / 18T AT402 / 18UWR4N2	Basic Tamil*/ Advanced Tamil** / Non-Major Elective 2**	2	—	75	75	3	2
Total Instruction Hours				30			675		25
V	III	18UCS509	C.P.9 – Software Engineering and Testing	6	25	75	100	3	4
		18UCS510	C.P.10 – Java Programming	5	25	75	100	3	5
		18UCS5CP	C.Pr.5 – Java Programming -Lab	6	40	60	100	3	2
		18UCS511	C.P.11 – Computer Networks	6	25	75	100	3	4
		18UCS5E1	Major Elective I	5	25	75	100	3	5
	IV	18UCS5S2	Skill Based Subject 3 – (Web Programming – Java Script, VB Script and ASP)	2	25	75	100	3	3
	Total Instruction Hours				30			600	
VI	III	18UCS612	C.P.12 – Software Project Management	4	25	75	100	3	4
		18UCS613	C.P.13 – Python Programming	4	25	75	100	3	5
		18UCS6CQ	C.Pr.6 – Python Programming Lab	6	40	60	100	3	2
		18UCS614	C.P.14 – Information Security	5	25	75	100	3	5
		18UCS6E2	Major Elective II	5	25	75	100	3	5
		18UCS6Z1	Project Work and Viva-Voce ***	4	20	80	100	3	4
	IV	18UCS6SM	Skill Based Subject 4 – (Web Programming Lab – Java Script, VB Script and ASP)	2	40	60	100	3	3
Total Instruction Hours				30			700		28
Part V	\$\$	Extension Activities *		-	50	-	50	-	1
GRAND TOTAL				180			3800		140

@ Hindi/Malayalam/French/Sanskrit

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

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

*** Project Report – 60 marks; Viva Voce -20 marks; Internal – 20 marks

\$\$ NCC / NSS / YRC / PYE / RRC / WEC / ECC

Note: In core/ allied subjects, paper numbers in both theory and practicals are included wherever applicable. However, the total credits and marks for core/allied subjects remain the same as stated below.

Tally Table:

S.No.	Part	Subject	Marks	Credits
1.	I	Language – Tamil/Hindi/Malayalam/ French/ Sanskrit	200	6
2.	II	English	200	6
3.	III	Core – Theory/Practical/Project	2100	77
		Allied	400	20
		Electives	200	10
4.	IV	Basic Tamil / Advanced Tamil (OR) Non-major elective	150	4
		Skill Based subject	400	12
		Environmental Studies	50	2
		Value Education	50	2
5.	V	Extension Activities	50	1
		Total	3800	140

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

ELECTIVE PAPERS:

1. Systems Software
2. Soft Computing
3. Client/Server Techniques
4. Cloud Computing
5. Artificial Intelligence
6. Data Mining and Warehousing

Any two papers will be selected by the students - one in V semester and one in VI semester.

NON-MAJOR ELECTIVE:

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

Note :

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

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	

2. Practical Examination:

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

3. Project Viva Voce:

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

Components of Continuous Internal Assessment

Components		Marks	Total	
Theory	CIA 1	75	(75+75 = 150/10)	
	CIA 2	75		
	Assignment/Seminar		5	25
	Attendance		5	
Practical	CIA Practical		25	
	Observation Notebook		10	40
	Attendance		5	
Project	Review		15	20
	Regularity		5	

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS101		Core Paper 1 – COBOL Programming		
Batch 2018-2019	Semester I	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To make use of COBOL programming in business, finance, and administrative systems.
2. To identify the four divisions of COBOL program and describe their purpose.
3. To construct conditions to execute procedures within a COBOL program.
4. To recognize similarities and common characteristics of two or more programming languages.

Course Outcomes (CO)

K1	CO1	Understand the syntax and semantics of the COBOL language
K2	CO2	Recognize how to develop and implement a program in the COBOL language
K3	CO3	Develop various forms of data representation and structures supported by the COBOL language
K4	CO4	Appreciate the appropriate applications (typically business) of the COBOL language

UNIT I

[13 Hours]

Introduction to COBOL - Character set - Constants and Variables - Arithmetic Operations - Layout of COBOL program –Divisions of COBOL- IDENTIFICATION DIVISION , ENVIRONMENT DIVISION, DATA DIVISION, PROCEDURE DIVISION- Code Characters – Edit Characters - Level numbers used in COBOL – Language Description notation.

UNIT II

[12 Hours]

Arithmetic Verbs- ADD, SUBTRACT, MULTIPLY, DIVIDE, COMPUTE- Data movement Verb MOVE - On Size Error and Rounded Options - IF statement - GOTO, GOTO DEPENDING ON Statements – Condition names (88 Level number)- Simple COBOL Programs.

UNIT III**[11 Hours]**

Perform statements – Simple Perform, Perform ... Thru, Perform ...Times, Perform ... Until, Perform ... varying – Renames Clause – Redefines Clause – Simple programs illustrating the use of the above verbs and clauses

UNIT IV**[12 Hours]**

Table handling – Syntax and rules of Occurs Clause –SORT verb syntax and rules – **Merge verb syntax and rules** * - Simple programs to demonstrate the applications of the Occurs clause and Sort/Merge Verbs.

UNIT V**[12 Hours]**

File Concepts – OPEN, CLOSE, READ, WRITE, AT END for Sequential file handling – STRING and UNSTRING verbs - Screen Section features – Simple business application programs like Pay Slip preparation, Electricity Bill preparation using Sequential file concepts.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. M.K.Roy & G.Dastidar (1989), “**COBOL Programming**”, Second Edition, TMH Publishers.

Reference Books:

1. V.Rajaraman (1997), “**COBOL Programming**”, Sixth Edition, Prentice Hall of India.
2. Stern and Stern (1994), “**COBOL Programming**”, Seventh Reprint, Tata McGraw Hill.

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	M	H
CO4	S	M	S	S	H

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCSICL		Title: Core Practical 1 – COBOL Programming - Lab		
Batch 2018-2019	Semester I	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To expose different features of COBOL language and implement them.
2. To learn the fundamental concepts of four Divisions.
3. To understand Input and Output Statements.
4. To develop programs relevant to business applications.

Course Outcomes (CO)

K1	CO1	Study the logical structure of a computer program and to develop programs in COBOL language.
K2	CO2	Understand Control structures.
K3	CO3	Learn how to compile, debug, link and executing COBOL programs.
K4	CO4	Demonstrate practical applications of programs developed in COBOL.

LIST OF PRACTICAL PROBLEMS

1. Write a program to explain the use of z,* edit characters. Read values through the keyboard and display both the unedited and edited data.
2. Write a program to find the biggest number among the three given numbers using IF statement of COBOL.
3. Write a program to convert the temperature given in Fahrenheit to Centigrade and vice versa using GO TO.. Depending ON option.
4. Write a program to calculate the factorial value of a given number using Perform ... until option of COBOL.
5. Write a program to calculate the Simple Interest for the money deposited in a bank.
6. Write a program to read the roll number, name and mark of 3 students using Occurs clause and display the details that are entered.
7. Write a program to demonstrate the Redefines Clause. Assume necessary data.

8. Write a program to demonstrate the Renames Clause. Assume necessary data.
9. Write a program to create a Sequential File for student details. Assume that a record of a student has the fields roll number, name and mark.
10. Write a program to demonstrate the use of SORT verb. Assume necessary data.
11. Write a program to demonstrate the use of MERGE verb. Assume necessary data.
12. A file contains the following records about a class.

<u>Fields</u>	<u>columns</u>
Serial number	1 - 4
Roll number	5 - 10
Name	11 - 30
Age	31 - 32
Sex	33
Year in the college	34

Select the record with the following characteristics and write them in two files.

File-1 : records of all male students over 18 years of age , who are in the third year in the college.

File -2 : records of all the female students under 19 of age, in the fourth year of the college.

Use conditions name for the sex and year in the college.

13. An electricity company supplies electricity to four types of customer coded 1,2,3&4. The rate schedule for customers is shown in one table as

customer code	1	2	2	3	3	4
consumption	all	below	above	below	above	all
	1000	1000	5000	5000	& above	
rate/unit	0.50	0.40	0.50	0.30	0.50	0.30

The customer record is :

col. 1-5	customer number
col. 6-30	name & address
col. 31-37	consumption in units
col. 38	customer code

Read a customer record and print a bill using GOTO DEPENDING ON statement.

14. Create a sequential file with the following record layout using the SCREEN SECTION

<u>Fields</u>	<u>Pictures</u>
Order number	9(6)
Customer number	9(5)
Salesman number	9(4)
Date	9(6)
Number of items	9
Product code	x(6)
Quantity	9(5)v99

15. Print the words of a given sentence one word per line. Display the first letter of all the words together as a single word at the end. The words in the sentence may be separated by 1 or more spaces.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

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	10	10
Program Coding	10	10
Execution & Modifications	5	5

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS202		Core Paper 2 – C Programming		
Batch 2018-2019	Semester II	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To develop an in-depth understanding of functional and logical concepts of C Programming.
3. To provide exposure to problem-solving through C programming.
4. To familiarize the basic syntax and semantics of C Language

Course Outcomes (CO)

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.

UNIT I

[12 Hours]

Introduction to C – Overview of Compilers and Interpreters – Structure of C Program- Programming Rules- Character Set – Keywords – Variables – Data types – Type Conversion – Constant and Volatile Variables. Operators and Expressions : Priority of operators – Arithmetic, Relational, Logical, Assignment, Increment / Decrement, Conditional, Bitwise and Special Operators. I/O in C : Formatted , Unformatted , Library Functions.

UNIT II

[12 Hours]

Decision Statements: if, if/else, switch, break, continue, goto. Loop Control Statements : Introduction – for, nested for loops- while, do-while statements.

UNIT III

[13 Hours]

Arrays: Introduction – Definition – 1D, 2D, 3D or Multi Dimensional Arrays. Strings: Standard Functions – Application of Strings. Pointers: Features – Declaration – Pointer and Arrays – Array of Pointers – Pointers to Pointers – Pointers and Strings – Void Pointers.

UNIT IV**[12 Hours]**

Functions: Definition- Declaration – Types of Functions – Call by Value – Call by reference – Recursion – Pointer to Function. Storage Class: Automatic, External, Static, Register variables. **Preprocessor Directives: Macros - Conditional Compilation – Predefined Macros** *.

UNIT V**[11 Hours]**

Structure and Union: Introduction – Declaration and initialization – Union. Files: Streams and File Types – File I/O – Structured Read and Write – Other File Function – Command Line Arguments – Application of Command Line Arguments.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Book:

1. Ashok N Kamthane (2002), “**Programming with ANSI and Turbo C**”, 1st Edition, Pearson Education Publications.

Reference books :

1. E .Balagurusamy (1998), “**Programming in ANSI C**”, TMH publications.
2. Henry Mullish & Herbert L Cooper (1996), “**The Spirit of C**”, Jaico Publication House.

MAPPING

CO \ PSO	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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS2CM		Core Practical 2 – C Programming - Lab		
Batch 2018-2019	Semester II	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To introduce the field of programming using C language.
2. To enhance the analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes (CO)

K3	CO1	Develop programming skills using the fundamentals and basics of C Language.
K3	CO2	Develop programs using the basic elements like control statements, Arrays and Strings
K4	CO3	Enable effective usage of arrays, structures, functions and pointers.
K5	CO4	Implement files and command line arguments.

LIST OF PRACTICAL PROBLEMS

1. Write a program to find the sum, average, standard deviation for a given set of numbers.
2. Write a program to generate 'n' prime numbers.
3. Write a program to find the biggest number among a set of numbers.
4. Write a program to arrange a set of numbers in ASCENDING ORDER using BUBBLE SORT.
5. Write a program to merge a set of numbers available in Two Array into a Single Array.
6. Write a program to calculate a sine value and compare it with built-in function.
[$x - x^3/3! + x^5/5! \dots\dots$]
7. Write a Recursive function to calculate factorial value which compute nCr value.
8. Write a program to find the number of palindromes in a given sentence.

9. Write a function to perform
 - i) String Copy
 - ii) String Concatenation
 - iii) String Reverse.
10. Write a program to implement LINEAR SEARCH to find a particular name in a list of names.
11. Write functions for following STACK operations
 - i) PUSH
 - ii) POP
 - iii) LIST STACK
12. Write a generalized program to perform Matrix Addition.
13. Write a program to print the student's marksheet assuming rno, name, marks in 5 subjects in a structure. Create an array of structures and print the marksheet in the university pattern.
14. Write a program to display the content of an array using pointers.
15. Write a program which takes a file as command line argument and copy it to another file.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

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	10	10
Program Coding	10	10
Execution & Modifications	5	5

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS303		Core Paper 3 – Computer Organization and Architecture		
Batch 2018-2019	Semester III	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To educate the basics of computer hardware and how software interacts with computer hardware.
2. To familiarize with different numbering methods like binary, octal, and hexadecimal.
3. To impart the knowledge of buses, I/O devices, flip flops, Memory and bus structure.
4. To understand the concepts of memory hierarchy and compare different methods for computer architecture.

Course Outcomes (CO)

K1	CO1	Remember basic structure of computer and numbering methods like binary, octal and hexadecimal and explain how arithmetic and logical operations are performed by computers.
K2	CO2	Understand various data transfer techniques in digital computer and control unit operations.
K3	CO3	Apply performance issues in processor and memory design of a digital computer various data representations.
K4	CO4	Analyze architectures and computational designs and computer architecture concepts related to design of modern processors, memories and I/Os.

UNIT- I

[15 Hours]

Representation of Information: Number System and Codes - Binary to Decimal Conversion – Decimal to Binary conversion – Octal Numbers – Hexadecimal Numbers – ASCII Code – Excess – 3 Code – Gray Code.

UNIT- II

[14 Hours]

Logic circuits : Gates – AND, OR, NOT, NAND and NOR gates – Truth Tables – Boolean Algebra – Karnaugh maps – Product of Sums method – Sum of Product Method – Don't Care Conditions – Multiplexers - Demultiplexers – Flip flops – RS,JK,D,T Flip-Flops- Decoders.

UNIT – III

[15 Hours]

Register transfer & Micro Operations: Register Transfer – Arithmetic Micro Operations – Logic Micro Operations – Shift Micro Operations – Arithmetic Logic Shift Unit. Central Processing Unit – Stack Organization – Instruction Formats.

UNIT – IV**[17 Hours]**

Input – Output Organization: Input-Output Interface – Asynchronous Data Transfer (strobe control & handshaking) – Priority Interrupt – Direct Memory Access – Input – Output Processor.

UNIT –V**[14 Hours]**

Memory Organization: ***Memory Hierarchy – Main Memory*** – Associative Memory – Cache Memory – Virtual Memory.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Books:

1. Albert Malvino, Donald P.Leach (1995), “**Digital Principles and Applications**”, Third Edition, McGraw Hill Company [Unit I, II].
2. M.MORRIS MANO (1999), “**Computer system Architecture** “, 3rd Edition, Pearson Education Publications, [Unit III, IV, V].

Reference Books:

1. T.C .Bartee (2003) , “ **Digital computer Fundamentals** “ , Sixth Edition, Tata McGraw Hill.
2. Salivaganan & S.Arivazhagan (2001), “**Digital Circuits and Design** “ Vikas Publ.
3. John P.Hayes (1998), “**Computer Architecture and Organization** “, Third Edition, Tata McGraw Hill Publishers Pvt Ltd.

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	H	M	S	H	H
CO4	S	S	S	S	M

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS304		Core Paper 4 – Database Management System		
Batch 2018-2019	Semester III	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To grasp the different issues involved in the design of a database system.
2. To study the physical and logical database designs and database modeling like relational, hierarchical, and network models.
3. To understand essential DBMS concepts such as: database security, integrity and normalization.
4. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling and designing a DBMS.

Course Outcomes (CO)

K1	CO1	Define data independence, data models for database systems, database schema and database instances.
K2	CO2	Understand and use data manipulation language to query and manage a database.
K3	CO3	Analyze and design a real database application.
K4	CO4	Apply normalization concepts for designing a good database with integrity constraints.

UNIT I

[14 Hours]

Introduction: Purpose of Database Systems - View of Data - Data Models - Database Languages - Transaction Management - Storage Management Database Administrator - Database Users – Overall System Structure.

Entity Relationship Model: Basic concepts - Keys - Entity Relationship Diagram, Weak Entity sets, Extended E-R Features : Specialization, generalization.

UNIT II

[17 Hours]

Relational Model: Relational Algebra - Views. SQL: Background - Basic Structure - Set Operations - Aggregate Functions - Null values - Derived Relations - Views - Modification of the database - Joined Relations - Data Definition Language.

UNIT III**[15 Hours]**

Integrity Constraints: Domain Constraints - Referential Integrity - Assertions - Triggers. Functional Dependencies – Relational Database Design: Pitfalls – Decomposition-Normalization using Functional Dependencies.

UNIT IV**[15 Hours]**

Object Oriented Databases: New Database Applications - Object Oriented Data Model - Object Oriented Languages - Persistent Programming Languages.

Database System Architecture: Centralized Systems- Client/ Server Systems – Parallel Systems- Distributed Systems- Network Types.

UNIT V**[14 Hours]**

New Applications: Decision Support Systems - Data Analysis - Data Mining - Data Warehousing - Spatial and Geographic Databases – **Multimedia Databases - Mobility and Personal Databases** * - Information-Retrieval Systems - Distributed Information Systems .

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Book:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan (1997), “**DATABASE SYSTEM CONCEPTS**”, Third Edition, Tata McGraw Hill International Editions.

Reference Books:

1. Alexis Leon and Mathews Leon (1999),”Database Management Systems”, Vikas Publications.
2. Elmasri Navathe (2006),”Database Management Systems”, Pearson Education Publications, Fourth Edition.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS305		Core Paper 5 – Object Oriented Programming with C++		
Batch 2018-2019	Semester III	Hours / Week 5	Total Hours 75	Credits 5

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	To be able to program 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.

UNIT I

[14 Hours]

Introduction to C++ - Key concepts of OOP – advantages – OOlanguages –I/O in C++.C++ declarations. Control structures: Decision making statements: if..Else, jump, goto, break, continue, Switch case statements. **Loops in C++: for, while, do..while loops***-Functions in C++- inline Functions- function overloading.

UNIT II

[16 Hours]

Classes and Objects : Declaring objects – defining member functions- static member variables and functions – array of objects – friend functions – overloading member functions – constructors and destructors –characteristics –calling constructors and destructors .

UNIT III**[15 Hours]**

Operator overloading: overloading unary, binary operators – overloading friend function-type conversion . Inheritance: Types of Inheritances – Single, multilevel, multiple, hierarchical, hybrid, Multipath inheritance- virtual base classes – abstract classes.

UNIT IV**[16 Hours]**

Pointers-Declaration-Pointer to class, object-this pointer – Pointer to derived classes and base classes- Arrays- characteristics – arrays of classes –Binding ,Polymorphism and Virtual Functions.

UNIT V**[14 Hours]**

Files – File Stream classes – File modes – Sequential File Read/Write operations – Templates – Exception handling – **Strings and String Functions** *.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. Ashok N Kamthane (2003), “**Object oriented Programming with Ansi and Turbo C++**”, 1st Edition, Pearson Education Publication.

Reference Books:

1. E.Balagurusamy (1998), “**Object oriented programming with C++**”, TMH Publication.
2. Maria Litvin & Gary Litvin (2002), “**C++ for you**”, Vikas Publication.
3. John R Hubbard (2002), “**Programming with C++**”, 2nd Edition, TMH Publication.

MAPPING

CO \ PSO	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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS3CN		Core Practical 3 – Object Oriented Programming with C++ - Lab		
Batch 2018-2019	Semester III	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To familiarize the students with language environment and to develop the programs for solving the problems using function overloading, constructors and object.
2. This course provides methods and technologies involved in building complex software. It also introduces concepts that includes various steps involved in developing software including requirement elicitation, system design, object design and testing.

Course Outcomes (CO)

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

LIST OF PRACTICAL PROBLEMS

1. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function PUSH() to insert an element and a member function POP() to delete an element. Check for overflow and underflow conditions.
2. Create a class ARITH which consists of a FLOAT and an INTEGER variable . Write member functions ADD() , SUB() , MUL() , DIV() , MOD() to perform addition ,multiplication, division and modulus respectively. Write member functions to get and display values.
3. Create a class MAT has a 2-Dmatrix and R & C represents the rows and columns of the matrix . Overload the operators +,-,* to add, subtract and multiply two matrices .Write member functions to get and display MAT object values.
4. Write a program to define Class A, B and C. The Class C is derived from A and B. Define count() member function in all the classes as virtual, count number of objects created.
5. Define a Class to represent a Bank Account. Include the following members:
 1. Name of the depositor.
 2. Account number.
 3. Type of account.
 4. Balance amount.

Member functions:

1. To assign initial values.
2. To deposit an amount.
3. To withdraw an amount after checking balance.
4. To display name and balance.

Write a main program to test the program.

6. Write a program to implement Destructors.
7. Write a program to implement multilevel inheritance.
8. Write a program to overload member functions in base and derived class.
9. Create a class STRING. Write member functions to initialize , get and display strings . Overload the operator + to concatenate two strings, == to compare 2 strings and a member function to find the length of the string.
10. Create a class which consists of EMPLOYEE detail like eno, ename, dept, basic salary, grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate da, hara, pf, depending on the grade and display the Payslip in a neat format using console I/O.
11. Create as class SHAPE which consist of two VIRTUAL FUNCTIONS Cal_Area() and Cal_PERI to calculate Area and Perimeter of various figures. Derive three classes SQUARE, RECTANGLE and TRIANGLE from the class SHAPE and calculate Area and Perimeter of each class separately and display the result.
12. Create two classes which consists of two private variables, one Integer and one Float variable in each class. Write member functions to get and display them. Write a FRIEND function common to arguments and the Integer and Float values of both the objects separately and display the result.
13. Write a user defined function USERFUN() which has the formatting commands like setw(), showpoint, showpos, precision(). Write a program which prints an multiplication table and uses USERFUN() for formatting.
14. Write a program to demonstrate the concept function with default arguments .
15. Write a program which takes a file as argument and copies in to another file with line numbers using Command Line Arguments.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

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	10	10
Program Coding	10	10
Execution & Modifications	5	5

MAPPING

CO \ PSO	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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS406		Core Paper 6 – Operating Systems		
Batch 2018-2019	Semester IV	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. Students will gain knowledge of basic operating system concepts.
2. To have an in-depth understanding of process concepts, deadlock and memory management.
3. To provide an exposure to scheduling algorithms, devices and information management.
4. Students will familiarize on the general structure of an operating system and case study is also provided.

Course Outcomes (CO)

K1	CO1	Remember the basic concepts of operating system.
K2	CO2	Understand the concepts like interrupts, deadlock , memory management and file management.
K3	CO3	Analyze the need for scheduling algorithms.
K4	CO4	Implement different algorithms used for representation, scheduling, allocation in DOS and UNIX operating system.

UNIT I

[14 Hours]

Introduction and Definition of OS - Process Concept : Definition of Process - Process States – Process State Transition – Interrupt Processing – Interrupt Classes - Context Switching
 Deadlock: Introduction - Deadlock Prevention - Deadlock Avoidance – Deadlock Detection – Deadlock Recovery - Indefinite Postponement.

UNIT II

[16 Hours]

Storage Management Real Storage: Real Storage Management Strategies – Contiguous Vs Non-Contiguous Storage Allocation – Single User Contiguous Storage Allocation – Fixed Partition Multiprogramming –Variable Partition Multiprogramming, Multiprogramming with Storage Swapping.

Virtual Storage: Virtual Storage Management Strategies- Page Replacement Strategies.

UNIT III**[15 Hours]**

Processor Management Job and Processor Scheduling: Preemptive Vs Non-Preemptive Scheduling - Priorities –Deadline Scheduling - FIFO – RR – Quantum Size – SJF - SRT – HRN.

Distributed Computing: Classification of Sequential and Parallel Processing – Array Processors – Dataflow Computers -Multiprocessing – Fault Tolerance.

UNIT IV**[15 Hours]**

Device and Information Management Disk Performance Optimization: Operation of Moving Head Disk Storage – Need for Disk Scheduling - Seek Optimization – FCFS – SSTF – SCAN – RAM Disks – Optical Disks.

File and Database Systems: File System – Functions – Organization – Allocating and Freeing Space – File Descriptor – Access Control Matrix.

UNIT V**[15 Hours]**

Case Studies MS-DOS: Introduction – Early History of MS-DOS -**User’s View of MS-DOS** *- Systems View of MS-DOS – The Future of MS-DOS.

UNIX: Introduction – History – The Shell – The Kernel – File System – Process Management – **Memory Management** *- The Input/Output System .

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. H.M.Deitel (2003), "**Operating Systems**", Second Edition,Pearson Education Publ.

Reference Books:

1. Achyut S Godbole (2002), "**Operating Systems**", TMH Publ.
2. Andrew S.Tanenbaum (1999), "**Modern Operating System**", Prentice Hall of India Pvt. Ltd., Delhi.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS407		Core Paper 7 – Data Structures		
Batch 2018-2019	Semester IV	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To educate the concepts of fundamentals of writing algorithms and approach in problem solving.
2. To represent the basic concepts of stack, queue, linked list, trees and graphs.
3. To understand the concepts of searching and sorting techniques.

Course Outcomes (CO)

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

UNIT I

[13 Hours]

Introduction – overview - **How to create programs and analyze them** *. Arrays – structures – ordered lists – representation of arrays – simple applications

UNIT II

[15 Hours]

Stacks and queues – Fundamentals – structure-operations –Multiple stacks and queues. Applications Evaluation of Expressions.

UNIT III

[16 Hours]

Linked lists – single linked lists – Linked stacks and queues – The storage pool - Applications –Polynomial addition, sparse matrices. Double Linked Lists – Dynamic storage management – Garbage collection and compaction.

UNIT IV

[16 Hours]

Searching and sorting: Binary, sequential, and Fibonacci – Internal sorting Insertion, quick, merge, heap, radix sorts – External sorting – Sorting with disks – K-way merging– sorting with tapes – Balanced merge - Polyphase merge. Symbol tables – Static tree – Dynamic tree – Hash tables.

UNIT V**[15 Hours]**

Files – **queries and sequential organizations** * – Index Techniques. File organizations Sequential, Random, Linked Organizations - Inverted files – Cellular partitions

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Book:

1. Ellis Horowitz & Sartaj Sahani (1999), “**Fundamentals of Data Structures**”, Galgotia book source.

Reference Books:

1. Ashok N Kamthane (2004), “**Programming and Data Structures**”, Pearson Education.
2. Robert Kruse, C.L.Jondo, Bruse Leung (2008), “**Data Structures and Program Design in C**”, Pearson Education, Asia, Second Edition.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS408		Core Paper 8 – Visual Basic and Oracle		
Batch 2018-2019	Semester IV	Hours / Week 5	Total Hours 75	Credits 5

Course Objective

1. The main aim of the course is to cover visual basic and oracle programming skills required for modern software development.
2. To study the advantages of Controls available with visual basic.
3. To gain a *basic* understanding of database access and management using data controls.
4. To facilitate the learner to carry out project works using the tools available in VB and Oracle.

Course Outcomes (CO)

K1	CO1	Demonstrate fundamental skills in utilizing the tools of a visual environment such as command, menus and toolbars.
K2	CO2	Implement SDI and MDI applications using forms, dialogs, and other types of GUI components.
K3	CO3	Understand the connectivity between VB with MS-ACCESS, ORACLE and SQL and SQL database
K4	CO4	Implement the methods and techniques to develop projects.

UNIT I

[14 Hours]

Introduction – Integrated Development Environment: Menu Bar, Tool Bar, Project Explorer Window, Property Window, Form Layout Window, Code Window – Properties, Methods, Events – Working With Forms – Declaring Data Types And Variables – **Built-In Functions** *-Procedures And Control Statements – Arrays.

UNIT II

[13 Hours]

Working with Controls – Classification of Controls – Text Box – Labels – Command Buttons – Check Box- Combo Box – List Box- Option Buttons – Frames – Timer Control – Scroll Bars – Menus & Dialog Box – Graphics Controls – SDI – MDI – Control Arrays.

UNIT III**[16 Hours]**

ODBC – DAO: Creating a Database, Creating a Record Set, Types of Record Set, Opening a Database, Add, Edit, Update and Delete Records, Moving to First, Last, Next and Previous Records in a Record Set, Searching a Record Set, Sorting a Record Set – Data Environment and Data Reports.

UNIT IV**[16 Hours]**

Basic database concepts, characteristics of relational DBMS model *, CODD's Law, ORACLE Tools.

Interactive SQL : Invoking SQL * Plus, Data Manipulation in DBMS – The Oracle data types – insertion, updating, deletion, modification – Select Command – Removing, Deleting, Dropping tables, Data Constraints, Arithmetic, Logical Operators, Oracle Functions, Grouping Data from Tables - Manipulating Dates.

UNIT V**[16 Hours]**

Joins, Sub Queries – Union, Intersect and Minus Clause, Granting Permissions.

PL/SQL: Introduction, PL/SQL Syntax, Understanding PL/SQL Block Structure, Oracle Transactions.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Books:

1. Gray Cornell (2003), "**Visual Basic 6 from ground up**" TMH, New Delhi, 1st Edition, (Unit I,II & III).
2. Ivan Bayross (1997), "**Commercial Application Development Using ORACLE Developer 2000**", BPB Publication, 1st Edition, (Unit IV and V).

Reference Books:

1. Deitel and Deitel, T.R.Nieto (1998), "**Visual Basic 6 - How to Program**", Pearson Education. First Edition.
2. Dr.P.S.Deshpande (2007), "**SQL and PL/SQL for Oracle Lock Black Book**", Dream Tech. Press, Edition.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS4CO		Core Practical 4 – Visual Basic and Oracle - Lab		
Batch 2018-2019	Semester IV	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. To develop applications using Graphical User Interface tools.
2. To understand the design concepts.
3. To design and build database systems and demonstrate their competence.

Course Outcomes (CO)

K1	CO1	Understand the concepts of Visual Basic
K2	CO2	Learn the advantages of Controls in VB
K3	CO3	Design and develop the event- driven applications using Visual Basic framework.
K4	CO4	Apply the knowledge of database methods.

LIST OF PRACTICAL PROBLEMS

1. Write a code for the following:

Scroll the text "Visual Programming Lab" from left to right and right to left on client area.

2. Divide the client area into 8 * 8 cells and while moving the mouse on these cells, the shape of cursor should change in every cell.
3. Using mouse down event, write a visual basic application to identify whether the right button or the left button was clicked
4. Write code to develop calculator program, which includes basic mathematical functions like addition, subtraction, multiplication and division.
5. Write a program to maintain the following information in a business database:
 - Supplier address
 - Customer address
 - Types of business
 - Stock level of business

Execute the program with suitable data and show the results in a NEAT format.

6. Use the circle method to draw several ellipse and circles so that they have the appearance of a pair of eyes.
7. Create a designer with basic primitives like circle, square, rectangle, ellipse and fill the same.
8. Design an application using the common dialog control to display the Font, Save and open dialog box without using the action property of the control.
9. Draw points on a form at random with red, blue and green colors.
10. Using the Flex Grid control write a program that calculates addition subtraction, multiplication, and division of numbers ranging from 1 to 12.
11. Develop a simple project on automated system for Railway Reservation
12. Develop a simple project on automated system for Payroll.
13. Develop a simple project on automated system for attendance maintenance.
14. Develop a simple project on automated system for students mark list preparation.
15. Develop a simple project on automated system for telephone billing.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Guidelines to the distribution of marks for Practical Examinations:

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

Record : **10 marks**

	Program1 (marks)	Program2 (marks)
Algorithm	10	10
Program Coding	10	10
Execution	5	5

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS509		Core Paper 9 – Software Engineering and Testing		
Batch 2018-2019	Semester V	Hours / Week 6	Total Hours 90	Credits 4

Course Objectives

1. To enhance the basic software engineering methods and practices.
2. To learn the techniques for developing software systems.
3. To understand the object oriented design.
4. To understand software testing approaches.

Course Outcomes (CO)

K1	CO1	Understand the basic concepts of software engineering
K2	CO2	Apply the software engineering models in developing software applications.
K3	CO3	Implement the object oriented design in various projects
K4	CO4	Analyze the various software testing approaches

UNIT I

[16 Hours]

Introduction – The Evolving Role of Software – Software Crisis – Software Myths – Software Engineering Technology – Software Process Models – Prototyping Model- Requirements Engineering – System Modeling.

UNIT II

[19 Hours]

Requirements Analysis and Elicitation for Software – Software Prototyping – Specification – Mechanics of Structured Analysis – Data Dictionary –Elements of Analysis Model- Functional Modeling and Information Flow - Transform Mapping – Transaction Mapping.

UNIT III

[18 Hours]

Object Oriented Design – Design for Object-Oriented Systems - System Design Process. Introduction: Quality, Quality Assurance and Quality Control - Testing, Verification and Validation. Types of Testing: White-Box Testing- Black-Box Testing.

UNIT IV

[19 Hours]

Integration Testing: What is Integration Testing-Integration Testing as a Type of Testing- Integration Testing as a Phase Testing - Scenario testing - System and Acceptance Testing: Functional versus Non-functional Testing - Functional Testing – Nonfunctional Testing – Acceptance Testing.

UNIT V**[18 Hours]**

Performance Testing: Introduction - Factors Governing Performance Testing- Methodology for Performance Testing- Regression Testing: What is Regression Testing- Types of Regression Testing - **Test Planning***, **Execution and Reporting***.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text books:

1. Roger S Pressman (2001), “**Software Engineering**”, 5th Edition, TMH Publishers [Unit I,II&III].
2. Srinivasan Desikan & Gopalswamy Ramesh (2006),”**Software Testing Principles and Practices**”, Pearson Education. [Unit IV & V]

Reference Books:

1. Ian Somerville (2001), “**Software Engineering**”, 6th Edition, Pearson Education Publication.
2. William E.Perry (2006), “**Effective Methods for Software Testing**”, 3rd Edition, Wiley, India.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS510		Core Paper 10 – Java Programming		
Batch 2018-2019	Semester V	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2. Understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods etc and exception handling mechanisms.
3. Concepts of inheritance, packages, interfaces and multithreading are introduced.

Course Outcomes (CO)

K1	CO1	Remember the fundamentals of programming such as variables, conditional statements and iterative execution statements.
K2	CO2	Understand the concepts of arrays, strings, packages and multithreading.
K3	CO3	Analyze the concepts of applet programming, graphics programming and files.
K4	CO4	Create a software application using the Java programming language

UNIT I

[12 Hours]

JAVA Evolution : History – Features – How Java differs from C and C++ - Java and Internet- Java and WWW – Web Browsers.Overview of Java Language : Introduction – Simple Java program – Structure – javaTokens – Statements-Java virtual Machine.

UNIT –II

[12 Hours]

Constants- variables – Data types – Operators and Expressions. Decision Making and Branching: If,If..else,else..if ladder,Switch, ?: operator Decision Making and Looping : While,do,for – jumps in loops-labelled loops. Classes,Objects and Methods.

UNIT –III

[13 Hours]

Arrays,Strings and Vectors- Interfaces:Multiple Inheritance-**Packages :Putting classes together** * – Multi Threaded Programming.

UNIT – IV

[11 Hours]

Managing Errors and Exceptions–Applet programming–**Graphics programming** *.

UNIT –V**[12 Hours]**

Files : Introduction – concept of streams – Stream classes – Using streams – I/O classes- File class – I/O Exceptions – creation of files- Reading/Writing characters /Bytes-Handling primitive data types – Random Access Files.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book :

1. E.Balagurusamy (2000), “**Programming with Java – A Primer**”, TMH Publications, 2nd Edition.

Reference Books:

1. Patrick Naughton and Herbert Schildt (2000), “**The Complete Reference Java 2**”, 3rd Edition, TMH Publications.
2. C.Xavier (2000), “**Programming with Java 2**”, Scitech Publications.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS5CP		Core Practical 5 – Java Programming - Lab		
Batch 2018-2019	Semester V	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

1. This course introduces computer programming using the JAVA programming language with object-oriented programming principles.
2. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, graphics concepts, applet programming concepts etc.,
3. Upon completion, students should be able to design, code and debug JAVA language programs.

Course Outcomes (CO)

K1	CO1	Remember the fundamentals of Java programming language
K2	CO2	Understand the basics of Java programming, multi-threaded programs and Exception handling
K3	CO3	Analyze and use Java in a variety of applications.
K4	CO4	Write and debug a software application developed using the Java programming language.

LIST OF PRACTICAL PROBLEMS

1. Write a program, which creates and displays a message on the window.
2. Write a program to draw several shapes in the created window.
3. Write a program to create an applet and draw grid lines.
4. Write a java program to create a frame with two buttons called father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother appear.
5. Write a java program to create four text fields for the name, street, city and pincode with suitable labels. Also add a button called my details, when you click the button your name, street, city and pincode must appear in the text fields.
6. Write a Java program to create a frame with three text fields for name, age and qualification and a text field of multiple line for address.
7. Write a Java program to demonstrate multiple selection list box.

8. Write Java program to create a menu bar and pull down menus
9. Write a Java program to create a window when we press M or m the window displays Good Morning A or a the window displays Good Afternoon E or e the window displays Good Evening N or n the window displays Good Night.
10. Write a program to move different shapes(Circle, Ellipse, Square, Rectangle) according to the arrow key pressed.
11. Write a program to draw circle, ellipse, square, rectangle at the mouse click position.
12. Write a program to handle the divide by zero exception
13. Write a program to create an exception called payoutofbounds and throw the exception.
14. Write a program to explain the multithreading with the use of multiplication tables. Three threads must be defined. and each one must create one multiplication table; they are 5 tables, 7 tables and 13 table.
15. Write a program to illustrate thread priority. Create three threads and assign three different priorities.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Guidelines to the distribution of marks for Practical Examinations:

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

Record : **10 marks**

	Program1 (marks)	Program2 (marks)
Algorithm	10	10
Program Coding	10	10
Execution	5	5

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS511		Core Paper 11 – Computer Networks		
Batch 2018-2019	Semester V	Hours / Week 6	Total Hours 90	Credits 4

Course Objectives

1. To educate the concepts of terminology and concepts of the OSI reference model and the TCP/IP reference model and protocols such as TCP, UDP and IP.
2. To be familiar with the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
3. Introduce the student to a network routing for IP networks and how a collision occurs and how to solve it and how a frame is created and character count of each frame.

Course Outcomes (CO)

K1	CO1	Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.
K2	CO2	Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security
K3	CO3	Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.
K4	CO4	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies;

UNIT I

[17 Hours]

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

UNIT II

[19 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.

UNIT III

[20 Hours]

The Data link layer: Data link layer design issues – error detection and correction. The Medium access control sublayer: The channel allocation problem – Multiple access protocols: Carrier sense multiple access protocols, collision-free protocols, Limited-Contention protocols – Bluetooth: Bluetooth Architecture, Bluetooth applications. Data link layer switching: repeaters, hubs, bridges, switches, routers and gateways.

UNIT IV**[19 Hours]**

The Network layer: Network layer design issues – Routing algorithms: The optimality principle, shortest path routing, flooding, distance vector routing, routing for mobile hosts. The Transport layer: The Transport service: Services provided to the upper layers, transport service primitives, Berkeley sockets – Elements of Transport protocols.

UNIT V**[15 Hours]**

The Application layer: DNS – The Domain Name System – Electronic mail: Architecture and services, the user agent. Network Security: Cryptography – Symmetric-Key algorithm: DES – Public Key algorithms – 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 Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Book:

1. Andrew S. Tanenbaum (2003), “**Computer Networks**”, 4th Edition, Pearson Edu Publications.

Reference Books:

1. Miller (2001), “**Data and Network Communications**”, Vikas Publications.
2. William A Shay (2001), “**Understanding Data Communications and Networks**”, 2nd Edition, Vikas Publications.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS612		Core Paper 12 – Software Project Management		
Batch 2018-2019	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To understand the overview of Software Project Characteristics and software Management.
2. To familiarize with the different methods and techniques used in project management.
3. To understand and reduce the failure issues of software projects.
4. To learn how effectively the project scheduling, risk analysis, quality management and project cost estimation can be implemented using various techniques.

Course Outcomes (CO)

K1	CO1	Analyze the fundamentals of project management and compare different software engineering process models.
K2	CO2	Understand various concepts involved in project management, project planning and project scheduling.
K3	CO3	Analyze project risks, monitor and track project deadlines and produce a work plan and resource schedule.
K4	CO4	Apply the project management tools and techniques in a diversity of fields that include new product and process development, construction, information technology, and applied research.

UNIT I

[17 Hours]

Product Life cycle: Introduction. Conventional Software Management: The waterfall model, Prototype Model, Rapid application development model and Spiral model. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT II

[20 Hours]

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections. The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT III

[17 Hours]

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases. Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT IV**[17 Hours]**

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, **Iteration workflows***.

UNIT V**[19 Hours]**

Checkpoints of the process: Major mile stones, Minor milestones, Periodic status assessments. Iterative process planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning. Project control and Process instrumentation: **The seven core Metrics***, pragmatic software Metrics, Metrics automation.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Book :

1. Walker Royce (2005), “**Software Project Management**”, Pearson Education.

Reference Books:

1. Bob Hughes and Mike Cotterell (2009), ”**Software Project Management**”, Tata McGraw-Hill 5th Edition.
2. Gobalswamy Ramesh (2003), “**Managing Global Software Projects**”, Tata McGraw Hill Publishing Company.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS613		Core Paper 13 – Python Programming		
Batch 2018-2019	Semester VI	Hours / Week 4	Total Hours 60	Credits 5

Course Objectives

1. To introduce the fundamentals of Python Programming.
2. To teach about the concept of Functions in Python.
3. To impart the knowledge of Lists, Tuples, Files and Directories.
4. To learn about dictionaries in python.

Course Outcomes (CO)

K1	CO1	Remembering the concept of operators, data types, looping statements in python programming.
K2	CO2	Understanding the concepts of Input / Output operations in file.
K3	CO3	Applying the concept of functions and exception handling
K4	CO4	Analyzing the structures of list, tuples and maintaining dictionaries.

Unit I

[13 Hours]

Introduction to Python: Introduction-Python Overview-Getting started with python-Comments-Python Identifiers-Reserved Keywords-Variables-Standard data types. Operators-Statement and expressions-String operations- Boolean expressions- Control statements- Iteration-While statement-Input from keyboard.

Unit II

[12 Hours]

Built-in functions- Composition of functions - User defined functions-Parameters and arguments-Function calls-The return statement-Python recursive function. Strings-Compound data types- Len function- String slices- Strings are immutable- Strings traversal-Escape characters- String formatting operators-String formatting functions.

Unit III

[13 Hours]

Lists - values and accessing elements - Lists and mutable - Deleting elements from list- Built-in list operations - Built-in list methods.

Tuples - Creating tuples – Accessing values in tuples – tuples are Immutable – Tuple assignment- Tuples as return values- Variable length argument tuples- Basic Tuple operations. Built-in tuple functions.

Unit IV**[10 Hours]**

Dictionaries – Creating a dictionary - Accessing values in a dictionary – Updating dictionary – Deleting elements from dictionary - Properties of dictionary keys – Operations in dictionary – Built-in dictionary methods.

Classes and Objects: Overview of OOP - Class Definition - Creating Objects - Objects as arguments - Objects as Return Values - Built-in class attribute - Inheritance – Method Overriding - Data Encapsulation - Data Hiding.

Unit V**[12 Hours]**

Files: Text files: Opening a file – Closing a file – The file object attributes- Writing to a file – Reading from a file - Renaming a file – Deleting a file – Files related methods.

Directories: mkdir() , chdir(). Exception: Built-in exceptions – Handling exceptions – Exception with arguments – User defined exceptions.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

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

Reference Book:

1. Ashok Namdev Kamthane, Amit Ashok Kamthane (2017), “**Programming and Problem Solving with Python**”, McGraw-Hill, First Edition.
2. **Martin Jones** (2015), “**Python for Complete Beginners**”, Createspace Independent Publisher, First Edition.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS6CQ		Core Practical 6 – Python Programming - Lab		
Batch 2018-2019	Semester VI	Hours / Week 6	Total Hours 90	Credits 2

Course Objectives

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

Course Outcomes (CO)

K1	CO1	Remember different types of operators in programming.
K2	CO2	Implement the concepts of built-in functions in programming.
K3	CO3	Analyze the use control structures in programming.
K4	CO4	Apply the concepts of exception handling in programs.

LIST OF PRACTICAL PROBLEMS

1. Write a program to solve quadratic equation.
2. Write a program to convert temperature in Celsius to Fahrenheit and Fahrenheit to Celsius.
3. Write a program to generate prime numbers upto a given number.
4. Write a program to multiply two matrices.
5. Write a program to create a simple calculator using functions.
6. Write a program to accept 5 subject marks and to calculate the total, average and grade of a student.
7. Write a program to generate an electricity bill.
8. Write a program to count the number of each vowel in a string.
9. Write a program to perform binary search for a given set of numbers.
10. Write a program to demonstrate tuples functions and operations
11. Write a program to demonstrate dictionaries functions and operations
12. Write a python program to demonstrate File Input and Output operations.
13. Write a program to demonstrate Multiple Inheritance.
14. Write a program to demonstrate Exception Handling
15. Write a program to demonstrate Classes and their Attributes.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Guidelines to the distribution of marks for practical Examinations:

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

Record: **10 marks**

	Program1 (marks)	Program2 (marks)
Algorithm	10	10
Program Coding	10	10
Execution	5	5

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS614		Core Paper 14 – Information Security		
Batch 2018-2019	Semester VI	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To learn basics of computer security and cyber crimes.
2. To familiarize the role of security in operations system and databases.
3. To know various types of viruses, attacks and threats in hardware, software and data security.

Course Outcomes (CO)

K1	CO1	Students can able to understand the basics of computer security and its terminology.
K2	CO2	Recapitulate various Attacks, Threats and Vulnerabilities in the system.
K3	CO3	Assess cyber security risk management policies in order to adequately protect critical information and assets.
K4	CO4	Students can employ, design and implement appropriate security technologies and policies to protect computers and digital information.

UNIT I

[17 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 : Protected Objects and Methods of Protection-Memory and Address Protection-Control of Access to General Objects-File Protection Mechanisms-User Authentication.

UNIT II

[19 Hours]

Program Security: Secure Programs- Nonmalicious Program Errors – Viruses and other Malicious Code - Targeted Malicious Code - Controls against Program Threats.

UNIT III

[18 Hours]

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

UNIT IV

[17 Hours]

Security in Networks: **Network Concepts***-Threats in Networks-Firewalls-Intrusion Detection Systems.

UNIT V**[19 Hours]**

Legal and Ethical Issues in Computer Security: Protecting Programs and Data-Information and the Law-Computer Crime- Ethical Issues in Computer Security.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. Charles P Pfleeger and Shai Lawrence Pfleeger, (2007), “**Security in Computing**”,Fourth Edition, Prentice Hall.

Reference Books:

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

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS6Z1		Project Work and Viva-Voce		
Batch 2018-2019	Semester VI	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To understand and select the task based on their core skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.

Course Outcomes (CO)

K3	CO1	Identify and formulate the problem
K4	CO2	Analyse the problem and collect necessary data.
K5	CO3	Design and develop the project using appropriate software by applying the programming skills.
K5	C04	Implement, evaluate and generate reports.

MARK DISTRIBUTION :

	Marks
CIA	20
Viva – Voce *	20
Project Record *	60

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

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS4A4		Allied 4 – Microprocessors, PC Hardware and Interfacing		
Batch 2018-2019	Semester IV	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To understand the design of the various functional units of digital computers.
2. To understand basic architecture of 16 bit and 32 bit microprocessors with block diagrams and pins and signals.
3. To make the students to estimate the required hardware and software resources for an electronic systems.
4. To discuss about the various types of storage systems and port systems.
5. To discuss about the various components of motherboard, serial port and parallel port.

Course Outcomes (CO)

K1	CO1	Familiar with the functionality of the various components of a system.
K2	CO2	Learning about interfacing and various applications of microprocessor.
K3	CO3	Comprehend the features of advanced microprocessors including Intel, Pentium, etc.
K4	CO4	Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.

UNIT I

[16 Hours]

8086 Microprocessor: Introduction – general organization of a Microcomputer - 8086 internal Architecture- Instructions-DataTransfer,Arithmetic, Bit Manipulation,String. The 8086 based system design: Pins and Signals-Pin Configuration, Signals, Interfacing memory-Memory Devices - Interrupts.

UNIT II

[16 Hours]

Peripheral Devices: Introduction- Programmable Peripheral Interface (8255A)-Internal blocks of 8255A -Priority Interrupt Controller (8259A)-Internal Block Diagram -Direct Memory Access Controller (8237)-Organisation of 8237-The Programmable Interval Timer (8254)-Internal Block Diagram-Universal Asynchronous Receiver Transmitter(UART)-Internal Block Diagram.

UNIT III**[14 Hours]**

Advanced Microprocessors: 80386-Internal Block Diagram, Internal Registers, 80486-Internal Blocks and signals , Internal Registers,Pentium - Internal Blocks and Signals, Pentium MMX, Pentium Pro, Pentium-II Microprocessor. Motherboard of IBM PC: Introduction, Motherboard Components

UNIT IV**[14 Hours]**

Drives: Introduction – Principles of Magnetic Storage – **Floppy Disk Drive – Hard disk drive-CD –ROM Drive** *. Peripherals: Video display system-Keybaord-Printer

UNIT V**[15 Hours]**

Parallel & Serial Ports: Parallel port – Standard Parallel port (SPP)- Enhanced Parallel port (EPP) –Serial Port: -Pins and Signals of serial port –BIOS serial port services. Universal Serial Bus: Introduction – Features of USB – USB System – USB Transfer – USB Controller

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. N. Mathivanan (2003), “**Microprocessors, PC Hardware and Interfacing**”- PHI Publications, New Delhi.

Reference Books:

1. Ramesh S. Gaonkar (1997), “**Microprocessor Architecture Programming and Applications with 8085**” - Penram International 3rd Edition.
2. A.P. Mathur (1998), “**Introduction to Microprocessors**” - Tata McGraw Hill Publishing Company.

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS3S1		Skill Based Subject 1 - (Web Programming - HTML, CSS, XML)		
Batch 2018-2019	Semester III	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. The course introduces the basic concepts of the World Wide Web, principles and tools that are used to develop Web applications.
2. To develop an ability to design and implement static and dynamic website.
3. Design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

Course Outcomes (CO)

K1	CO1	Remember the internet related concepts that are vital in understanding web development.
K2	CO2	Understand the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
K3	CO3	Design and develop web pages using CSS styles, internal and/or external style sheets.
K4	CO4	Develop interactive web applications through coding using HTML , CSS and XML.

UNIT I

[5 Hours]

Introduction to Internet: Features of Internet – World wide web – www resources – Application of web – types of browsers – using the browser –URL – Internet Addressing – Over view of web page and home page.

UNITII

[7 Hours]

HTML : Introduction – markup language – editing HTML – common tags – headers – meta Elements – text styling – linking - Internal Linking - images – creating & using Image maps- formatting text with Special characters – **horizontal rules and More line breaks***.

UNIT III

[6 Hours]

Intermediate HTML: Introduction – unordered list – nested and **ordered list*** – Basic HTML Tables – Intermediate HTML table and Formatting – basic HTML Forms and Formatting – More Complex HTML Forms – Frameset Element – Nested Framesets.

UNIT IV

[5 Hours]

Cascading Style Sheet (CSS): Creation of CSS – Border, margin, text and paragraph Style sheet – website design and management. Simple applications of web site, web pages and home pages.

UNIT V**[7 Hours]**

Active XML : Introduction – structuring data – XML name space – DTDs and schemas – XML vocabularies – document object model (DOM) – DOM methods – Simple API for XML – Extensible Style Sheet Language (XSL) – Simple object access protocol (SOAP) – web services.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Book :

1. Deitel, Neito (2003), “**Internet and World Wide Web – How to program** “, Pearson Education Asia.

Reference Books:

1. Maureen Adams, Sherry Boneli (1998), “**Internet Complete** “, BPB Publication, 1st Edition.
2. Thomas A.Powell (2004), “**The Complete Reference HTML and XHTML**”, fourth Edition, Tata McGraw Hill pub. Company Ltd, New Delhi.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS4SL		Skill Based Subject 2 - (Web Programming Lab - HTML, CSS, XML)		
Batch 2018-2019	Semester IV	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. The course introduces the basic concepts of the World Wide Web, principles and tools that are used to develop Web applications.
2. To develop an ability to design and implement static and dynamic website.
3. Design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

Course Outcomes (CO)

K1	CO1	Remember the internet related concepts that are vital in understanding web development.
K2	CO2	Understand the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
K3	CO3	Design and develop web pages using CSS styles, internal and/or external style sheets.
K4	CO4	Develop interactive web applications through coding using HTML, CSS and XML.

LIST OF PRACTICAL PROBLEMS

1. Design a web page for a company using HTML Formatting Tags
2. Design a web page for library system using HTML Tags
3. Design a web page for your Department using HTML Tags
4. Design a web page with the following components
 - a. Image
 - b. Hyperlink
5. Design a web page which shows your resume using CSS
6. Design a web page to advertise a product using style sheets
7. Design a web page for a company using CSS
8. Create XML document to store information about books and create the DTD files

9. Use Microsoft DSO to connect HTML form or VB form with the book's XML document and display the information.
10. Create a web service for currency conversion (at five currencies) with the appropriate client program.

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Guidelines to the distribution of marks for Practical Examinations:

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

Record : **10 marks**

	Program1 (marks)	Program2 (marks)
Algorithm	10	10
Program Coding	10	10
Execution	5	5

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS5S2		Skill Based Subject 3 – (Web Programming – Java Script, VB Script and ASP)		
Batch 2018-2019	Semester V	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. Students will gain the skills and project based experience needed for entry into web application and development careers.
2. To understand internet technology concepts.
3. To understand the concepts of scripting languages VBScript, JavaScript and ASP.

Course Outcomes (CO)

K1	CO1	Understand VB Script language programming constructs.
K2	CO2	Gain knowledge of JavaScript language programming constructs.
K3	CO3	Develop web pages using ASP
K4	CO4	Develop a dynamic web page using client side and server side scripting languages.

UNIT I

[7 Hours]

Java Script: Introduction to Scripting: Introduction – memory concepts – arithmetic – decision making – java script Internet & www resources. Java script Arrays: Passing arrays to functions – Multi Subscripted arrays. Java Script Control Structures – Selection Structure: If – If Else, Repetition Structure: While – For – Do while – Logical operators.

UNIT II

[6 Hours]

Java script Functions : Introduction – program modules in java script programmer defined functions – Function Definition : Duration of identifiers – scope rules – recursion – java script global functions.

Java Script Objects : Introduction – Thinking about objects – Math, Strings, Date, **Boolean and Number Objects***.

UNIT III

[4 Hours]

VB Script : Introduction – Operators – Data Type and Control Structures – VB Script Functions – Arrays – String Manipulation – Classes and Objects - **Operator Precedence Chart***.

UNIT IV**[8 Hours]**

Dynamic HTML : Object Model and Collections : Introduction – Object Referencing – Collection all and Children – Dynamic Styles – Dynamic Positioning – Using the Frame Collection – navigator Object.

Dynamic HTML : Event Model : Introduction – event ON CLICK – event ON LOAD – error handling with ON ERROR – Tracking the mouse with event ONMOUSEMOVE – Rollovers with ONMOUSEOVER and ONMOUSEOUT – Form Processing with ONFOCUS and ONBLUR – More Form Processing with ON SUBMIT and ON RESET – Event Bubbling – More DHTML Events.

UNIT V**[5 Hours]**

Active Server Pages (ASP) : Introduction – How ASP works – Client side scripting versus server side scripting – Using personnel web server or Internet Information Server – Server Side activeX Components – File System Objects – session Tracking and cookies – accessing a database from an ASP .

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book :

1. Deitel, Neito (2003), “**Internet and World Wide Web – How to Program “**, Pearson Education Asia.

Reference Books :

1. Achyut S.Godbole, Atul Kahate (2003), “**Web Technologies – TCP/IP to Internet Application Architectures”**, Tata McGraw Hill Pub.Company Ltd.
2. Thomas A.Powell (2004), “**The Complete Reference HTML and XHTML”**, Fourth Edition, Tata McGraw Hill pub. Company Ltd., New Delhi.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UCS6SM		Skill Based Subject 4 – (Web Programming Lab – Java Script, VB Script and ASP)		
Batch 2018-2019	Semester VI	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To develop the proficiency in implementing various programming concepts using Scripting Languages like JavaScript, VBScript, and ASP in the workings of the web and web applications
2. To familiarize how JavaScript programs are used in a web page including the use of event-handlers and the Document Object Model.
3. To understand and practice embedded dynamic scripting on client side Internet Programming.
4. Students gain the skills and project-based experience needed for entry into web design and development careers.

Course Outcomes (CO)

K1	CO1	Remember client-Side Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications
K2	CO2	Understand difference between client side web technologies and server side web technologies
K3	CO3	Apply role of languages like HTML, JavaScript, VBScript, ASP and protocols in the workings of the web and web applications
K4	CO4	Analyze a web project and identify its elements and attributes in comparison to traditional projects and build customize web sites and web applications

LIST OF PRACTICAL PROBLEMS

1. Design a web page for creating email id using java script
2. Design a web page for computing payroll processing using java script
3. Design a web page for creating online quiz using java Script
4. Design a web page for computing Electricity Bill Preparation using VB script
5. Design a web page for computing student mark list using VBScript
6. Write a VBScript to design a Calculator.
7. Design & develop web site for any business application.(ASP)
8. Develop a web page for landing of a new product.(ASP)

9. Write a program in ASP to Delete and Modify data in database table.
10. Create ASP applications for voting facility

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Guidelines to the distribution of marks for practical Examinations:

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

Record : 10 marks

	Program1 (marks)	Program2 (marks)
Algorithm	10	10
Program Coding	10	10
Execution	5	5

MAPPING

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

S – Strong

H – High

M – Medium

L – Low

Programme Code : 09	B.Sc Computer Science		
Batch : 2018-2019	Elective Paper – Systems Software		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objective

1. To comprehend the processing of programs on a computer system.
2. To understand the design and implementation of language processor.
3. To enhance the ability of program generation through expansion.
4. To gain knowledge about Code optimization and software tools.

Course Outcomes (CO)

K1	CO1	Know the program generation and program execution activities in detail.
K2	CO2	Understand the concepts of Macro Expansions.
K3	CO3	Gain the knowledge of Editing processes.
K4	CO4	Apply appropriate software tools for program development.

UNIT I

[18 Hours]

Language Processors : Introduction – Language Processing activities – Fundamentals of language processing – Fundamentals of language specification – Language processor development tools.

UNIT II

[18 Hours]

Assemblers : Elements of assembly language programming – A simple assembly scheme – Pass structure of assemblers – Design of a two pass assembler – Pass I of the assembler – Pass II of the assembler.

UNIT III

[18 Hours]

Macros and Macro Processor : Macro definition and call – Macro expansion – Nested macro calls – Advanced macro facilities – Design of a macro preprocessor – Design of a macro assembler .

UNIT IV**[19 Hours]**

Compilers and Interpreters : Aspects of compilation – Memory allocation – Compilation of expressions – A toy code generator for expressions – Intermediate code for expressions - Compilation of control structures – Code optimization – optimizing transformations – Local optimization – Global optimization – Interpreters.

UNIT V**[17 Hours]**

Linkers : Relocation and linking concepts – Design of a linker – Self-relocating programs – Linking for overlays – Loaders.

Software Tools : Software tools for program development – **Editors – Debug monitors *** – Programming environments – User interfaces.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. D.M. Dhamdere (2002), “**Systems Programming And Operating Systems**” Tata McGraw-Hill Publishing Company Limited -Second Revised Edition .

Reference Books:

1. Leland.L.Beck (1997), “**An Introduction to System Programming**”, Addison Wesley, Third Edition.
2. John J.Donovan (1991), ”**System Programming** “, MCGraw Hill Edition.

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	S	H	M	H
CO4	S	S	S	S	H

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

Programme Code : 09	B.Sc Computer Science		
Batch : 2018-2019	Elective Paper – Soft Computing		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To Identify and describe soft computing techniques and their roles in building intelligent machines.
2. To recognize the feasibility of applying a soft computing methodology for a particular problem.
3. To identify and select a suitable Soft Computing technology to solve the problem and construct a solution and implement a Soft Computing solution.

Course Outcomes (CO)

K1	CO1	Remember Neural Networks, architecture, functions and various algorithms involved.
K2	CO2	Understand the fundamental theory and concepts of neural networks, several neural network paradigms and its applications.
K3	CO3	Apply soft computing techniques to solve engineering or real life problems
K4	CO4	Analyze the genetic algorithms and their applications and neural network architectures.

UNIT I

[19 Hours]

Introduction - History of artificial neural networks – Knowledge based information processing – Neural information processing – Hybrid intelligence. Basic neural computational models: Basic concepts of neural networks – Inference and learning – classification models .

UNIT II

[17 Hours]

Association Models – Optimization Models – Self Organization Models. Learning – Supervised and Unsupervised – Introduction – Statistical Learning.

UNIT III

[19 Hours]

AI Learning – Neural Network Learning – Genetic Algorithms – Knowledge Based Neural Networks : Introduction – Rule based Neural Networks – Network Training.

UNIT IV

[19 Hours]

Mathematical Modelling – The Application of Neural Networks – Neural Networks as Mathematical Models – Knowledge Based Approaches – Complex Domains – **Expert System Heuristics** *.

UNIT V**[16 Hours]**

Hierarchical Models - Parallel Models – Differentiation Models – Control Networks.Discovery – Introduction – Symbolic Methods – Neural Network Methods – **Structures and Sequences ***.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. LiMin Fu (2003) “**Neural Networks in Computer Intelligence**”, Tata McGraw-Hill, 1st edition, ISBN 0-07-053282-6.

Reference Books:

1. Satish Kumar (2008), ”**Neural network – A class Room Approach**”, Tata McGraw-Hill,1st edition.
2. James.A.Freeman,David M.Skapura (2008), ”**Neural Network – Algorithms applications and programming techniques**”,Pearson education, 1st edition.

MAPPING

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

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

Programme Code : 09	B.Sc Computer Science		
Batch : 2018-2019	Elective Paper – Client / Server Techniques		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To improve the role of server and client over a network.
2. To gain exposure on most common used servers.
3. To understand the concept of Data ware house.
4. To develop a client -server based application.

Course Outcomes (CO)

K1	CO1	Remember the concepts of client server techniques
K2	CO2	Understand the client and server operating systems and middleware
K3	CO3	Realize the concept of Data Ware house
K4	CO4	Analyze the web security and understand the concepts of DCOM, OLE and CORBA.

UNIT I

[18 Hours]

Client Server computing - What is Client/Server - File servers, Database servers, Transaction servers, Group ware servers, Object servers, Web servers - **FAT servers or FAT clients** * - client / server Building blocks .

UNIT II

[16 Hours]

Client/Servers and operating systems - Needs of Client/server from an OS - server scalability - Client Anatomy - Client server hybrids .

NOS : Creating the single system image - Peer-to-peer communications – Sockets- Remote procedure calls(RPC) - Messaging and Queuing: The MOM Middleware - MOM VS RPC.

UNIT III

[13 Hours]

SQL Database Servers - What does a Database server do - Stored procedures, Triggers and rules. Data ware houses - OTP (Online Transaction Processing) Decision Support systems (DSS)- Executive Information System (EIS) -The Data ware house - EIS/DSS : From Queries, to OLAP (OnLine Analytical Processing), Data mining.

UNIT IV**[14 Hours]**

Client/Server Transaction Processing - the ACID properties - Transaction Models - TP Monitors - Client/server groupware - importance of groupware - The components of groupware - 3-Tier Client/server, object style - Distributed objects, CORBA style Object management Architecture - CORBA 2.0.CORBA Object - CORBA common facilities - CORBA Business objects.

UNIT V**[14 Hours]**

Web client/Server - What is URL? - Shortest HTML tutorial - HTTP-3 tier client/server, Web style - HTML Web based forms - CGI: The server side of the Web - Web Security - **The Internet and the Intranets** * - The DCOM/OLE object Web - The CORBA Object Web.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Book:

1. Robert Orfali, Dan Harkey, Jeru Edwards (1997) “**The Essential Client / Server Survival Guide**”, Galgotia Publications Pvt. Ltd, 2nd Edition.

Reference Books:

1. Dawna Travis Dewire (2013) “**Client Server Computing**”, Tata Mcgraw Hill Publishing Co Ltd.
2. Joe Salemi (1992), “**PC Magazine Guide to Client / Server Database**”, Pearson Professional Education.

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	M	H	H
CO4	S	S	S	S	M

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

Programme Code : 09	B.Sc Computer Science		
Batch : 2018-2019	Elective Paper – Cloud Computing		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objective

1. To understand the basic knowledge about the cloud computing techniques and architecture.
2. To learn the presents cloud computing collaborations and applications.
3. To impart the new concept of various virtualization in cloud computing
4. To gain knowledge of cloud services and cloud security.

Course Outcomes (CO)

K1	CO1	Understand the concepts of cloud Architecture and its services.
K2	CO2	Classify different services providers and its services, tools.
K3	CO3	Demonstrate various web based applications for collaborating everyone in the cloud computing.
K4	CO4	Analyze the best service provider for cloud computing in terms of storage, services.

UNIT-I

[14 Hours]

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

UNIT-II

[15 Hours]

Cloud Computing Architecture: Introduction - Cloud Reference Model – Types of Clouds – Organizational aspects.

UNIT – III

[16 Hours]

Accessing the Cloud : Platforms – Web Applications – Web Browsers. Cloud Storage: Overview – Cloud Storage Providers.

UNIT – IV**[15 Hours]**

Cloud Applications: Scientific Applications: Healthcare, Geosciences – Business and Consumer Applications: CRM and ERP, **Media Applications***, **Multiplayer Online Gaming***.

UNIT – V**[15 Hours]**

Standards: Application – Client – Infrastructure – Service. Software as a Service: Overview – Driving Forces - Industries – Healthcare, Banking.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion / Assignment

Text Books:

1. Anthony T.Velte ,Toby J.Velte, Robert Elsenpeter (2010), “**Cloud Computing – A Practical Approach**” , TMH (UNIT I, UNIT III, UNIT V).
2. Rajkumar Buyya, Christian vecchiola , Thamarai selvi (2013), “**Mastering Cloud computing**”, Mc Gram Hill Edu, (UNIT II, UNIT IV).

Reference Books:

1. Haley Beard (July 2008), “**Cloud Computing Best Practices for measuring processes for on demand computing, Applications and data centers in the cloud with SLA’s** “ .
2. Judith Hurwitz, Robin Bloon (2009),” **Cloud Computing for Dummies**”.
3. Michael Miller (2009), “ **Cloud computing – Web based application** “ , Pearson Edu Inc, First Impression.

MAPPING

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

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

Programme Code : 09	B.Sc Computer Science		
Batch : 2018-2019	Elective Paper – Artificial Intelligence		
	Hours / Week 5	Total Hours 75	Credits 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.
K5	CO5	Demonstrate the development of AI systems by encoding the knowledge.

UNIT I

[15 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

[13 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

[16 Hours]

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

UNIT IV

[16 Hours]

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

UNIT V**[15 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 Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / 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**", 4th Edition, Pearson Education Publ.
2. V.S.Janakiraman and K.Sarukesi (2001), "**Foundations of AI and Expert System**", Mac Milan India Ltd.

MAPPING

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

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

Programme Code : 09	B.Sc Computer Science		
Batch : 2018-2019	Elective Paper – Data Mining and Warehousing		
	Hours / Week 5	Total Hours 75	Credits 5

Course Objectives

1. To introduce the basic concepts of Data Warehouse and Data Mining techniques.
2. To study the methodology of Clustering, OLAP tools and OLTP tools to derive business rules for decision support systems
3. To develop and apply critical thinking, problem-solving, and decision-making skills.

Course Outcomes (CO)

K1	CO1	Remember the concepts of the data mining techniques, algorithms, methods and tools.
K2	CO2	Understand an application by using various data mining techniques to identify a pattern that evolves in various business domains.
K3	CO3	Apply the patterns that can be extracted on application of data mining techniques in various domains
K4	CO4	Analyze the market needs by applying suitable OLAP operations

UNIT I

[13 Hours]

Expanding of Universe of Data – Production Factor – Data Mining – Data Mining versus Query Tools – Data Mining in marketing – Practical Applications. Learning – Self-Learning Computer Systems – Machine Learning and Methodology of Science – Concept Learning. Knowledge Discovery process: Data Selection – Cleaning – Enrichment – Coding – Data Mining — Reporting.

UNIT II

[12 Hours]

Preliminary Analysis of the data set using Relational Query tools – Visualization Techniques – Likelihood and Distance – OLAP tools – K-Nearest Neighbor – Decision Trees – Association Rules * – Neural Networks – Genetic Algorithms–Different forms of Knowledge – Ten Golden Rules.

UNIT III

[11 Hours]

Customer Profiling – Predicting Bid Behavior of Pilots – Discovering Foreign Key Relationships – Learning as Compression of data sets –Content of Message – Noise and Redundancy – Significance of Noise –Fuzzy Databases – The traditional theory of the relational database – From Relations to Tables – Denormalization – Data Mining Primitives.

UNIT IV**[12 Hours]**

Data warehousing: Introduction –characteristics of a data warehouse -data marts - other aspects of data mart. Online analytical processing: Introduction - OLTP & OLAP systems – data modeling- star schema for multidimensional view - data modeling - multifact star schema or snow flake schema - OLAP TOOLS - **State of the market: Cognos Powerplay*** OLAP TOOLS and the internet.

UNIT V**[12 Hours]**

Developing a Data warehouse: Why and how to build a data warehouse - **data warehouse architectural strategies and organization issues** * - design consideration - data content - metadata distribution of data - tools for data warehousing – Application of data warehousing in e-government.

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

Teaching Methods

Chalk and Talk Method / Demonstration / Powerpoint Presentation / Seminar / Quiz / Discussion /Assignment

Text Books:

1. Pieter Adrians, Dolf Zantinge, (1998), “**Data Mining**”, Addison Wesley, (Units I,II & III).
2. C.S.R.Prabhu, (2007), “**Data Warehousing – Concepts, Techniques, Products and Applications**”, PHI, Second Edition, (Units IV & V).

Reference Books :

1. Alex Berson, Stephen J. Smith (2007), “ **Data Warehousing, Data Mining & OLAP**”, Tata McGraw-Hill Edition, Tenth Reprint, (for Unit V).
2. C.S.R Prabhu (2003),”**Data Mining Introductory and Advanced Topics**”, Pearson education.

MAPPING

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

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18EVS101		Part – IV - Environmental Studies		
Batch	Semester	Hours/Week	Total Hours	Credits
2018-2019	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

[6 hours]

Multidisciplinary Nature of Environment

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

UNIT II

[6 hours]

Ecosystems

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

UNIT III

[6 hours]

Biodiversity and its Conservation

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

UNIT IV

[6 hours]

Environmental Pollution

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

UNIT V**[6 hours]****Social Issues and the Environment**

Sustainable Development – 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.

Question Paper Pattern
(External only)

Duration: 3 hours

Total Marks : 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

Programme Code : 09		B.Sc Computer Science		
Course Code: 18VED201		Part – IV – Value Education -Moral and Ethics		
Batch	Semester	Hours/Week	Total Hours	Credits
2018-2019	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 of life.
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.

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.

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 Society Publication.

Question Paper Pattern

(External only)

Duration: 3 hours

Total Marks: 50

Answer all Questions (5 x 10 = 50 Marks)

Essay type, either or type questions from each unit.

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UHR3N1		Non- Major Elective I - Human Rights		
Batch	Semester	Hours/Week	Total Hours	Credits
2018-2019	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.

UNIT I

[6 Hours]

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

UNIT II

[6 Hours]

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

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

UNIT III

[6 Hours]

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

UNIT IV

[6 Hours]

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

UNIT V

[6 Hours]

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

Books for Study:

1. Human Rights

Compiled by Dr.V.Sugantha, Dean(Unaided),
Kongunadu Arts and Science College,
Coimbatore –29.

Book for Reference:

1.Human Rights,
Humanitarian Law and
Refugee Law

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

2. Promoting Women's Rights
As Human Rights

Publisher : United Nations.
New York., 1999.

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

Programme Code : 09		B.Sc Computer Science		
Course Code: 18UWR4N2		Non- Major Elective II - Women's Rights		
Batch	Semester	Hours/Week	Total Hours	Credits
2018-2019	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.

UNIT I **[6 Hours]** **Laws, Legal Systems and Change**

Definition - Constitutional law, CEDAW and International Human Rights – Laws and Norms – Laws and Social Context – Constitutional and Legal Framework.

UNIT II **[6 Hours]** **Politics of land and gender in India**

Introduction – Faces of Poverty – Land as Productive Resources – Locating Identities – Women's Claims to Land – Right to Property - Case Studies.

UNIT III **[6 Hours]** **Women's Rights: Access to Justice**

Introduction – Criminal Law – Crime Against Women – Domestic Violence – Dowry Related Harassment and Dowry Deaths – Molestation – Sexual Abuse and Rape – Loopholes in Practice – Law Enforcement Agency.

UNIT IV **[6 Hours]** **Women's Rights**

Violence Against Women – Domestic Violence - The Protection of Women from Domestic Violence Act, 2005 - The Marriage Validation Act, 1982 - The Hindu Widow Re-marriage Act, 1856 - The Dowry Prohibition Act, 1961.

UNIT V**[6 Hours]****Special Women Welfare Laws**

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

BOOK FOR STUDY : Published by Kongunadu Arts & Science College, 2011.

Reference Books:

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

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 : 09		B.Sc Computer Science		
Non- Major Elective – Consumer Affairs				
Batch	Semester	Hours/Week	Total Hours	Credits
2018-2019	III	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.

UNIT I

[6 Hours]

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

UNIT II

[6 Hours]

The Consumer Protection Law in India - Objectives and Basic Concepts: Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice, restrictive trade practice.

Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels; Adjudicatory Bodies: District Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA with important case law.

UNIT III

[6 Hours]

Grievance Redressal Mechanism under the Indian Consumer Protection Law - Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy available; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

Leading Cases decided under Consumer Protection law by Supreme Court/National Commission: Medical Negligence; Banking; Insurance; Housing & Real Estate; Electricity and Telecom Services; Education; Defective Products; Unfair Trade Practices.

UNIT IV**[6 Hours]**

Role of Industry Regulators in Consumer Protection

- i. Banking: RBI and Banking Ombudsman
- ii. Insurance: IRDA and Insurance Ombudsman
- iii. Telecommunication: TRAI
- iv. Food Products: FSSAI
- v. Electricity Supply: Electricity Regulatory Commission
- vi. Real Estate Regulatory Authority

UNIT V**[6 Hours]**

Contemporary Issues in Consumer Affairs - Consumer Movement in India: Evolution of Consumer Movement in India, Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing, Sustainable consumption and energy ratings. Quality and Standardization: Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance; Role of International Standards: ISO an Overview.

Note: Unit 2 and 3 refers to the Consumer Protection Act, 1986. Any change in law would be added appropriately after the new law is notified.

Suggested Readings:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi (2007), Consumer Affairs, Universities Press.
2. Choudhary, Ram Naresh Prasad (2005), Consumer Protection Law Provisions and Procedure, Deep and Deep Publications Pvt Ltd.
3. G. Ganesan and M. Sumathy (2012), Globalisation and Consumerism: Issues and Challenges, Regal Publications
4. Suresh Misra and Sapna Chadah (2012), Consumer Protection in India: Issues and Concerns, IIPA, New Delhi
5. Rajyalaxmi Rao (2012), Consumer is King, Universal Law Publishing Company
6. Girimaji, Pushpa (2002), Consumer Right for Everyone Penguin Books.
7. E-books :- www.consumereducation.in
8. Empowering Consumers e-book, www.consumeraffairs.nic.in
9. ebook, www.bis.org
10. The Consumer Protection Act, 1986 and its later versions.

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.