BACHELOR OF COMPUTER TECHNOLOGY

SYLLABUS: 2017-18 Onwards

Dr. N.G.P ARTS AND SCIENCE COLLEGE (Autonomous)
(Re-Accredited with A Grade by NAAC)
(Affiliated to Bharathiar University,)
Dr. N.G.P. Nagar - Kalapatti Road
Coimbatore-641 048

BACHELOR OF COMPUTER TECHNOLOGY
REGULATIONS

ELIGIBILITY

A candidate who has passed in Higher Secondary Examination with any Academic stream or Vocational stream as one of the subject under Higher Secondary Board of Examination and as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the Bachelor of Computer Technology Degree Examination of this College after a course of study of three academic years.

PROGRAMME EDUCATIONAL OBJECTIVES

The Curriculum is designed to attain the following learning goals which students shall achieve by the time of their graduation:

1. Demonstrating a significant understanding the Key Concepts of various Computer technologies.
2. To stimulate the interest among the learners on various technologies through Lab sessions.
3. Inculcating professional competence in technologies, software design, database and Quality Assurance.
4. To facilitate the learners to develop skills to meet the requirements of the corporate.
5. To develop competency in research and in current technologies.

SCHEME OF EXAMINATION

Course Code	Course	Hrs of Instruction	Exam Duration (Hrs)	CA	CE	Total	Credit Points
First Semester							
Part – I							
17UTL11T/ 17UHL11H/ 17UML11M/ 17UFL11F	Tamil-I/ Hindi-I/ Malayalam-I/ French-I	5	3	25	75	100	3
Part – II							
17UEG12F	English –I	5	3	25	75	100	3
Part – III							
17UCT13A	Core I : C Programming	6	3	25	75	100	5
17UCT13P	Core Lab I : Programming in C	4	3	40	60	100	2
17UCT13Q	Core Lab II : Office Tools Using Internet	3	3	20	30	50	2
17UMT1AA	Allied - 1 : Basic Mathematics	5	3	25	75	100	4
Part – IV							
17UFC1FA	Environmental Studies	2	2	-	50	50	2
		30				600	21
Second Semester							
Part - I							
17UTL21T/ 17UHL21H/ 17UML21M/ 17UFL21F	Tamil-II/ Hindi-II/ Malayalam-II/ French-II	5	3	25	75	100	3
Part - II							
17UEG22F	English –II	5	3	25	75	100	3
Part - III							
17UCT23A	Core II : C++ Programming	6	3	25	75	100	5
17UCT23P	Core Lab III : Programming in C++	4	3	40	60	100	2
17UCT23Q	Core Lab IV : Digital Media Lab	3	3	20	30	50	2
17UMT2AA	Allied – 2 : Computer Based	5	3	25	75	100	4

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Dr. N.G.P. Arts and Science College (Autonomous)

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr. P. R. MUTHUSWAMY.
PRINCIPAL
Dr. NGP Arts and Science College
Dr. NGP - Kalapatti Road
Coimbatore - 641 048
Tamilnadu, India

17UMT2AA	**Allied - 2** : Computer Based Optimization Techniques	5	3	25	75	100	4
Part - IV							
17UFC2FA	Value Education: Human Rights	2	2	-	50	50	2
		30				**600**	**21**

Third Semester

Part - III							
17UCT33A	Core III : Data Structures	5	3	25	75	100	5
17UCT33B	Core IV : Java Programming	5	3	25	75	100	5
17UCT33P	Core Lab V :Programming in Java	4	3	40	60	100	2
17UCT3AA	**Allied 3** : Digital Logic and Design	4	3	20	55	75	4
17UCT3SA	Skill Based Course 1 : Web Technology	4	3	20	55	75	4
17UCT3SP	Skill Based Lab 1 : Web Technology Lab	4	3	30	45	75	2
Part IV							
17UED34K	NMEC - I	2	2	-	50	50	2
17UFC3FA/ 17UFC3FB	Basic Tamil / Women's Rights	2	2	-	50	50	2
		30				**625**	**26**

Fourth Semester

Part – III							
17UCT43A	Core V : Operating System	6	3	25	75	100	5
17UCT43B	Core VI : Relational Data Base Management System	6	3	25	75	100	5
17UCT43P	Core Lab VI : Relational Data Base Management System	4	3	40	60	100	2
17UCT43Q	Core Lab VII : Programming in Linux	4	3	20	30	50	2
17UCT4AA	**Allied 4** : Software Testing	6	3	20	55	75	4
Part IV							

17UED44K	NMEC - II	2	2	-	50	50	2
17UFC4FA / 17UFC4FB	Advanced Tamil / General Awareness	2	2	-	50	50	2
		30				**525**	**22**

Fifth Semester

	Part – III						
17UCT53A	Core VII: Data Communication and Networks	5	3	25	75	100	5
17UCT53B	Core VIII: C#.Net Programming	5	3	25	75	100	5
17UCT53P	Core Lab VIII: Programming in C#. Net	4	3	40	60	100	2
17UCT53Q	Core Lab IX: Network Lab	4	3	20	30	50	2
17UCT5EA/EB	Elective I :	4	3	20	55	75	4
17UCT5SB	Skill Based Course 2 : Android Technology	4	3	20	55	75	4
17UCT5SP	Skill Based Lab 2 : Android Technology Lab	4	3	30	45	75	2
17UCT53T	Industrial Training	Grade A to C					
		30				**575**	**24**

Sixth Semester

	Part – III						
17UCT63A	Core IX: Open Source Tools	5	3	25	75	100	5
17UCT63B	Core X: Network Security and Cryptography	5	3	25	75	100	5
17UCT63P	Core Lab X : Open Source Tools Lab	5	3	40	60	100	2
17UCT63V	Core XI : Project Work Lab	5	3	20	55	75	4
17UCT6EA/EB	ELECTIVE II :	5	3	20	55	75	4
17UCT6EC/ED	ELECTIVE III :	5	3	20	55	75	4

	Part-V						6
17UEX65A	Extension Activity	-	-	50	-	50	2
		30				**575**	**26**
					Grand Total	**3500**	**140**

ELECTIVE – I

(Student shall select any one of the following course as Elective in fifth semester)

S. No.	Course Code	Name of the Course
1.	17UCT5EA	Middleware Technologies
2.	17UCT5EB	Cloud Computing

ELECTIVE – II

(Student shall select any one of the following course as Elective in sixth semester)

S. No.	Course Code	Name of the Course
1.	17UCT6EA	Mobile Computing
2.	17UCT6EB	Big Data and Analytics

ELECTIVE – III

(Student shall select any one of the following course as Elective in sixth semester)

S. No.	Course Code	Name of the Course
1.	17UCT6EC	Internet of Things
2.	17UCT6ED	Graphics and Multimedia

NON MAJOR ELECTIVE COURSES

- The department offers the following two papers as Non Major Elective Courses for other than the computer subjects related students.

- Student shall select any one of the following subject as Non Major Elective Courses during their III and IV semester

S. No.	Course Code	Name of the Course
1	17UED34K	Multimedia
2	17UED44K	ORACLE

FOR PROGRAMME COMPLETION

Students shall complete:

- Language papers (Tamil/Malayalam/French/Hindi, English) in I and II semester.

- Environmental Studies and One Value Education in I and II semester respectively.

- Allied papers in I, II, III and IV semesters.

- One Value Education and General Awareness in III and IV semester respectively.

- Non Major Elective Courses in the III and IV semester respectively.

- Extension activity in VI semester.

- Elective papers in the fifth and sixth semesters.

- An in-house project at the end of VI semester.

- Students must undergo Industrial training for 15 – 30 days during IV Semester Summer Vacation. Evaluation of the Report done by the Internal and external Examiner in the V Semester. Based on their performance Grade will be awarded as A to C.

    A- 75marks and above

    B- 60-74 marks

    C- 40-59 marks

    Below 40 marks – Re appear (RA)

Total Credit Distribution

Subjects	Credits	Total		Credits	Cumulative Total
Part I: Tamil	3	2x 100 =	200	06	**12**
Part II: English	3	2x 100 =	200	06	
Part III:					
Core	5	10x100=	1000	50	**114**
Core Lab	2	6 x 100 =	600	12	
Core Lab	2	4X50=	200	08	
Project Lab	4	1x75=	75	04	
Elective	4	3x75=	225	12	
Allied Theory	4	2 x 100 =	200	08	
Allied Theory	4	2x75=	150	08	
Skill Based	4	2x75=	150	08	
Skill Based Lab	2	2x75=	150	04	
Part IV:					
Value Education	2	2 x 50 =	100	04	12
Environmental	2	1 x 50=	50	02	
General	2	1x50=	50	02	
NMEC	2	2 x 50 =	100	04	
Part V:					
Extension	2	1x50	50	02	**02**
Total			**3500**	**140**	**140**

Earning Extra credits is not mandatory for programme completion

Extra credits

Course	Credit	Total credits
BEC/ Self study courses	1	1
Hindi / French/ Other foreign Language approved by certified Institutions	1	1
Type Writing / Short Hand Course	1	1
Diploma/certificate/CPT/ACS Foundation/ NPTEL Course	1	1
Representation – Academic/Sports /Social Activities/ Extra Curricular / Co-Curricular activities at University/ District/ State/ National/ International	1	1
TOTAL		5

Rules:

The students can earn extra credit only if they complete the above during the programme period (I to V semester) and based on the following criteria. Proof of Completion must be submitted in the beginning of VI Semester. (Earning Extra credits is not mandatory for programme completion)

Student can opt BEC course/ Self study course to earn one credit. They have to Enroll and complete any one of the course during their programme period before fifth semester (I semester to V semester).

Self study paper offered by the Computer Technology Department

S. No.	Semester	Course Code	Course Title
1.	III	17UCTSS1	Personality Development
2.		17UCTSS2	Social Networking

Student can opt Hindi/ French/ Other foreign Language approved by certified Institutions to earn one credit. The certificate (Hindi) must be obtained from Dakshina Bharat Hindi Prachar Sabha and He/ she has to enroll and complete during their programme period (first to fifth semester)

Student can opt for Type writing /short hand course to earn one credit extra. He/she has to enroll and complete the course during their programme period to obtain certificate through TamilNadu Board of Technical Education

Student can opt for Diploma/certificate/CPT/ACS Foundation / NPTEL Course to earn one credit extra. Student who opt for Diploma/ Certificate course have to enroll any diploma/certificate course offered by Bharathiar University through our Institution. Student who opt for CPT/ ACS/CMA have to enroll and complete at foundation level during the programme period. The course content of which shall be equivalent to that prescribed by ICAI/ICMA/ICSI. Students who opt for NPTEL course should complete certificate through NPTEL.

Award Winners in Academic/ Representation in Sports /Social Activities/ Extra Curricular/ Co-Curricular Activities at University/ District/ State/ National/ International level can earn one credit extra.

PROGRAMME OUTCOMES

On the successful completion of the programme, the following are the expected outcomes

PO.No	PO Statements
1	Understand proficient, ethical, and social issues and community responsibilities
2	Capability to intend, execute and assess a computer based system on par with the industry standards through the ability to identify the problem and capability to provide a solution
3	Correlate the knowledge of mathematics and computing in the field of project development and apply the obtained knowledge in real – time platform using latest tools and technologies
4	Improve the ability to communicate effectively and to work as individual or team in the industry / enterprise / community
5	Ability to excel in the field of IT and ITES by enduring learning to accomplish their goals

17UCT13A	CORE : I C PROGRAMMING	SEMESTER - I

PREAMBLE:

- To know the basics of C programming language.
- To understand the basic syntax of decision making and branching statements, arrays, strings, structures, union , pointers and functions.
- To remember the concepts of file management and error handling.

COURSE OUTCOMES:

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

CO No.	CO. Statement	Knowledge Level
1	Learn the fundamentals of C programming language	K1
2	Understand the principles of control structures and arrays	K2
3	Apply the knowledge of strings and functions	K3
4	Build programs using structures, union and pointers	K3
5	Expose the concept of file management and error handling	K2 & K3

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	M
CO2	M	M	S	M	M
CO3	M	M	S	M	S
CO4	S	S	M	M	M
CO5	M	S	S	M	M

S- Strong , M- Medium , L- Low

17UCT13A	CORE : I C PROGRAMMING	SEMESTER - I

Hours/Week: 5
Credit Points : 5

CONTENTS

UNIT – I

Overview of C: History of C – Importance of C – Basic structure of C programs. Constants, variables and data types: Character set – C Tokens – Keywords and identifiers – Constants – Variables – Declaration of storage classes – Assigning values to variables Defining symbolic constants. Operators and expression – Evaluation of expressions – Precedence of arithmetic operators – Type conversions in expressions – Operator precedence and associatively – Mathematical functions. Managing input and output operations: Reading and writing a character – Formatted input and output.

UNIT – II

Decision making and branching: Simple IF, IF-ELSE, Nesting of IF-ELSE, ELSE-IF ladder, Switch statements – GOTO statements. Decision making and looping: WHILE statement – DO statement – FOR statement – Jumps in loops. Arrays: Definition & Declaration – One dimensional – Two dimensional – Multi dimensional arrays.

UNIT – III

Character arrays and strings: Introduction – Declaring and initializing string variables – Reading strings from terminal – Writing strings to screen – String handling functions. User Defined functions: Introduction – Needs & Elements of User Defined function –Definition – Return values and their types – Function calls – Function declaration – Category of

functions – Nesting of functions – Recursion – Passing arrays and Strings to functions – The scope, lifetime & Visibility of Variables.

UNIT – IV

Structures and Unions: Introduction – Defining a structure – Declaring structure variables – Accessing structure members – Structure initialization – Arrays of structures – Arrays within structures – Structures within structures – Structures and functions – Unions – Bit fields. Pointers: Introduction – Understanding pointers – Accessing the address of a variable – Initializing of pointer variables. Pointers and arrays – Pointers and character strings – Pointers as function arguments.

UNIT – V

File Management: Introduction – Defining and opening a file –Closing a file – Input /Output operation on files – Error handling during I/O operations – Random access files – Command line arguments.

TEXT BOOK

1. Programming in ANSI C, E. Balagurusamy Tata McGraw Hall, New Delhi, 7th Edition,2017.

REFERENCE BOOK

1. "C: The complete Reference —, Herbert Schildt,Mc Graw Hill,New Delhi, 4th Edition,2003.
2. PROGRAMMING IN C, B.L.JUNEJA, Cengage Learning India 5th Edition,2011.

17UCT13P	CORE LAB I: PROGRAMMING IN C	SEMESTER - I

Hours/Week:4

Credit Points:2

CONTENTS

1. Program to find the sum, average, standard deviation for a given set of numbers.

2. Program to generate n-prime numbers.

3. Program to display transpose of matrix.

4. Program to generate Fibonacci series.

5. Program to print magic square of order n where n > 3 and n is odd.

6. Program to sort the set of n-numbers in ascending order.

7. Program using pointer to check whether the given string is a palindrome or not.

8. Program to count the number of Vowels in any sentence.

9. Program to find the factorial of a number using recursive function.

10. Program to print the student's Mark sheet assuming roll no, name, and marks in 5 subjects as array of structures and print the mark sheet in the university pattern.

11. Program to use function pointers to add two matrices and to return the resultant matrix to the calling function.

12. Program to take a file as command line argument and copy it to another file. At the end of the second file write the total i) no of characters ii) no. of words and iii) no. of lines.

17UCT13Q	CORE LAB II : OFFICE TOOLS USING INTERNET	SEMESTER - I

Hours/Week:4
Credit Points:2

CONTENTS

MS – WORD

1. Formatting word document using template *

2. Sending letters using mail merge.

3. Table creation and chart preparation*.

MS – EXCEL

4. Prepare mark statement with following conditions using data filter and data sort.

(i) mark-list in ascending order.

(ii) average greater than or equal to 60.

(iii) average between 50 and 60.

(iv) average below 40.

5. Generate EB bill using MACROS

6. Create employee details and make use of any 10 mathematical functions.

MS-POWERPOINT

7. Using slide master design master title style, master sub-title style, master text styles.

8. Download professional slide template and advertise a product.

9. Prepare an organizational chart for MNC using smart art.

MS-ACCESS

10. Create students details table

11. Create employee details table

12. Create movie details table *

*- details can be downloaded from internet

17UMT1AA	ALLIED-1: BASIC MATHEMATICS	SEMESTER - I

PREAMBLE:

- Understand the basic concepts of Mathematics.
- To know about the applications of Statistical and Numerical Techniques of Mathematics.

COURSE OUTCOMES:

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

CO Number	CO Statement	Knowledge Level
CO 1	Learn about Numerical Differentiation	K1
CO 2	Learn about Numerical Integration	K1
CO 3	Apply Statistical Techniques for data collection	K2
CO 4	Solve the problems related to Measures of central tendency	K2
CO 5	Solve the problems related to System of Simultaneous Linear Algebraic Equation	K3

MAPPING WITH PROGRAMME OUTCOMES

POS/COS	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	M	S	M	S
CO3	M	S	S	M	M
CO4	M	M	S	M	M
CO5	M	M	M	M	M

(S-Strong, M-Medium, L-Low)

17UMT1AA	ALLIED-1: BASIC MATHEMATICS	SEMESTER - I

Hours / Week: 5
Credit Points: 4

CONTENTS

UNIT - I

System of Simultaneous Linear algebraic Equation: Gauss elimination - Gauss Jacobi Gauss Jordon - Gauss Seidal methods.

UNIT - II

Numerical Differentiations - Newton's forward Difference - Backward Difference -Stirling's formula.

UNIT - III

Numerical Integration - Trapezoidal Rule & Simpson's rule - Numerical solutions of ordinary differential Equations -Taylor series for first order derivative.

UNIT - IV

Statistics: Meaning - Definition – Collection of data - Classification and Tabulation – Diagrammatic Representation and Graphical Representation.

UNIT - V

Measures of Central Tendency : Mean – Median – Mode - Measures of dispersion :Range – Standard deviation.

TEXT BOOKS:

Kandasamy,P.and Thilagavathi ,K. 2004. Numerical Methods .S.Chand and Company Ltd., New Delhi. (Unit I , II &III)

R.S.N.Pillai,V.Bagavathi.2002. STATISTICS. S.Chand and Company Pvt. Ltd.

REFERENCE BOOKS:

Gupta, S.P. and Gupta, M.P . 2002. Business Statistics . Sultan Chand and Sons.

Venkataraman , M.K. 2004. Numerical Methods in Science & Engineering . NPC . Revised Edition -

17UCT23A	CORE II: C++ PROGRAMMING	SEMESTER - II

PREAMBLE;

- To understand the basics of OOPs concept and basic syntax of various statements in C++.
- To know about functions, classes and objects, operator overloading and inheritance concepts.
- To remember the concepts of pointers, arrays and virtual functions.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand the basics of OOPs concept ,IO Stream, Control structures	K1
2	Demonstrate the structure of functions, classes and objects.	K2
3	Apply the knowledge on operator overloading and inheritance concepts.	K2 & K3
4	Usage of pointers, arrays and virtual functions.	K3
5	Apply the concepts of string, files and exception handling.	K3

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	S
CO2	M	M	S	M	M
CO3	M	M	S	M	M
CO4	M	M	M	M	M
CO5	M	S	S	M	M

S- Strong , M- Medium , L- Low

17UCT23A	CORE II: C++ PROGRAMMING	SEMESTER - II

Hours/Week: 5
Credit Points : 5

CONTENTS

UNIT - I

Introduction to C++ - key concepts of Object-Oriented Programming – Advantages – Object Oriented Languages.

I/O in C++ : Streams in C++-Predefined Streams-Buffering – Stream Classes- Formatted and Unformatted data- Unformatted Console I/O Operation – Type casting with cout statements- C++ Declarations.

Control Structures: - Decision Making and Statements: If.. Else, jump, go to, break, continue, Switch case statements. Loops in C++: For, While, Do.

UNIT - II

Functions in C++: Parts of Function – Passing Arguments - Inline functions –Function overloading .

Classes and Objects : Classes in C++- Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions.

Constructor and Destructor : Constructor and Destructor - Characteristics –Application with constructors-Overloading Constructor-Destructors.

UNIT - III

Operator Overloading: The Keyword Operator- Overloading unary, binary operators – Overloading Friend functions – type conversion.

Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT - IV

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes.

Arrays : Characteristics – Initialization of arrays using functions-Memory models – new and delete operators – dynamic object.

Virtual Functions: Rules for Virtual Functions -Pure Virtual Functions.

UNIT - V

String – Declaring and Initializing string objects – String Attributes.

Files – File stream classes – file modes – Sequential Read / Write operations- Error Handling Functions-**Exception Handling**.

TEXT BOOKS:

1. Ashok N. Kamthane. 2013. OBJECT-ORIENTED PROGRAMMING WITH ANSI AND TURBO C++, Pearson Education Publication, 2 Edition

REFERENCE BOOKS:

1. E. Balagurusamy. 2005. OBJECT-ORIENTED PROGRAMMING WITH C++, Tata Mc-Graw Hill Publication.
2. Yashvant. P. Kanetkar. 2007. Let us C++, BPB, New Delhi.

| 17UCT23P | **CORE LAB III: PROGRAMMING IN C++** | **SEMESTER - II** |

Hours/Week : 4

Credit Points: 2

CONTENTS

1. Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable and the Member functions ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Using a member function to get and display values.

2. Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.

3. Program to create a class FLOAT that contains one float data member, overloading all the four Arithmetic operators so that they operate on the object FLOAT.

4. Program to create a class STRING, with a Member Function to initialize, get and display strings, overload the Operator **+** to Concatenate two Strings, = = to Compare two strings

5. Program to create a class, which consists of EMPLOYEE Detail(E_Number, E_Name, Department, Basic, Salary, Grade), with a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

6. Program to create a class SHAPE with two VIRTUAL FUNCTIONS Calculate_Area() and Calculate_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE,

RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.

7. Program to create two classes; each consists of two private variables, an integer and a float variable. Write member functions to get and display them. Write a FRIEND Function common to both classes, which takes the object of above two classes as arguments and the integer and float values of both objects separately and display the result.

8. Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.

9. Program to check whether the given string is a palindrome or not using Pointers.

10. Program to count number of vowels and spaces in a string.

11. Program to create a File and to display the contents of that file.

12. Program to merge two files into a single file.

17UCT23Q	CORE LAB IV : DIGITAL MEDIA LAB	SEMESTER - II

Hours/Week:4
Credit Points : 2

CONTENTS

1. Create a Sun Flower.

2. Create Water Drops and See thru text with sceneries.

3. Animate Plane Flying in the Clouds.

4. Create Plastic Surgery for Nose.

5. Create Mouse.

6. Create Military Clothe.

7. Create Stone Texture and Ice Text.

8. Create Rollover Buttons.

9. Create Realistic Stone Structure.

10. Create Web Page.

11. Create Realistic Blood Structure.

12. Create Fog Effects.

17UMT2AA	ALLIED-2 : COMPUTER BASED OPTIMIZATION TECHNIQUES	SEMESTER- II

PREAMBLE:

- Understand various mathematical applications in industries.

- Decision making for real time Problems.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Learn about Linear Programming Problem	K1
CO2	Learn about Elements of Queuing System	K1
CO3	Apply game theory to analyze different situations of each player	K2
CO4	Apply Mathematical Techniques to find solution in the real life situations	K2
CO5	Solve the problems related to Network Analysis	K3
CO6	Solve the problems related to Transportation and Assignment	K3

MAPPING WITH PROGRAMME OUTCOMES

POS/COS	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	S
CO2	M	S	S	M	M
CO3	M	M	M	M	M
CO4	M	M	S	M	S
CO5	M	S	M	M	M
CO6	M	M	S	M	M

(S-Strong, M-Medium, L-Low)

17UMT2AA	**ALLIED-2 : COMPUTER BASED OPTIMIZATION TECHNIQUES**	**SEMESTER - II**

Hours / Week: 5
Credit Points: 4

CONTENTS

UNIT - I

Linear Programming -Mathematical formulations of linear Programming -Graphical method - Simplex method.

UNIT - II

Transportation problem - Assignment problem - Traveling Salesman Problem.

UNIT - III

Game Theory -Concept of Pure and Mixed Strategies -Solving 2 x 2 matrixes with and without saddle point -n x 2 -2 x m games.

UNIT - IV (Derivations not included)

Queuing Theory : Introduction – Queuing system – Characteristics of Queuing system – symbols and Notation – Classifications of queues – Problems in $(M/M/1) : (\infty/FIFO)$.

UNIT - V

PERT & CPM -Network representation -Backward pass -Forward pass -Computation -PERT Network -Probability factor .

TEXT BOOK:

1. *Manmohan, Gupta, P.K and Kanthiswarup.,* **Operations Research.** S. Chand & sons, 1997

REFERENCE BOOKS

1. *Hamdy A Taha.,* **Operations Research.** Pearson Education. 7th edition, 2002.

2. *Gupta, P.K. and Hira, D.S.,* **Problems in Operations Research.** S. Chand Publication,2004.

17UCT33A	CORE III: DATA STRUCTURES	SEMESTER - III

PREAMBLE:

- To remember and understand the algorithms
- To understand the fundamentals of linked list
- To analyze the tree concepts.
- To understand graph & its techniques.
- To learn about various sorting methods.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Apply and analyze various problems using stack & queue techniques.	K3
2	Develop algorithms for linked list methods.	K3
3	Problem solving approaches in trees.	K4
4	Analyze algorithms and determine time efficiency.	K3
5	Understand advanced data structure techniques.	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	M	M	M	M	S
CO3	M	S	M	M	M
CO4	M	M	S	S	M
CO5	M	S	S	M	M

| 17UCT33A | CORE III: DATA STRUCTURES | SEMESTER - III |

Hours/Week: 5

Credit Points: 5

CONTENTS

UNIT - I

Introduction: Introduction of Algorithms, Performance Analysis. **Arrays and structures**: Representation of Arrays, Array create, insert and delete of data elements - sparse Matrices.

Stacks and Queues: Stacks - Queues - Circular Queues - Evaluation of Expression -Infix to Postfix Conversion.

UNIT - II

Linked List: Singly Linked List : Insertion – Deletion – reverse the elements - Linked Stacks and Queues - Polynomial Addition – Circular Linked Lists - Doubly Linked List .

UNIT - III

Trees: Basic Terminology and Representation - Binary Trees - Binary Tree Representations - Binary Trees Traversals - Threaded Binary Trees - Binary Search Trees – Search , Insert , Delete .

UNIT - IV

Graphs: Terminology and Representations – **Traversals** : Depth First Search, Breadth First Search – Minimum cost Spanning Trees- Shortest Paths and Transitive Closure

UNIT – V

Searching: Linear and Binary Search **Sorting:** Bubble sort - Insertion Sort - Quick Sort - Merge Sort - Heap Sort - **Hashing Techniques** : Static Hashing : Hash Tables - Hashing Functions- Overflow handling – Dynamic hashing- directories .

TEXT BOOKS:

1. *Horowitz, Shani, Anderson - Freed* **Fundamentals of Data Structures in C**[2nd Edition] Universities Press. (Unit I – Unit – V), 2008.

REFERENCE BOOKS:

1. . *Ellis Horowitz, Sartaj Shani*, "**Data and File Structures**", Galgotia Publication (Unit IV – Unit – V),2010.

2. Malik,D,S., 2003. **Data structures using C++** [1st Edition] Cengage learning

3.*Vaugha H.Patil, 2012.* **Data Structures Using C++**[1st Edition] Oxford Higher Education

17UCT33B	CORE IV: JAVA PROGRAMMMING	SEMESTER - III

PREAMBLE:

- To Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- To Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- To be aware of the important features of java programming
- To Apply the concepts of multithreading, packages and string handling functions
- To be able to use the Java SDK environment to create, debug and run simple Java programs.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand the format and use of objects.	K1
2	Learn basic input/output methods and their use.	K1
3	Apply inheritance, interface, exception, packages and its use.	K3
4	Analyze JAVA applets concepts and JAVA applications concepts.	K4
5	Understand the use of various system libraries and to develop the JAVA applets and application programs.	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	M
CO2	S	S	M	M	M
CO3	M	M	S	M	M
CO4	M	M	M	S	S
CO5	M	M	S	M	S

17UCT33B	CORE IV: JAVA PROGRAMMMING	SEMESTER - III

Hours/Week: 5
Credit Points : 5

CONTENTS

UNIT - I

Introduction to Object-Oriented Programming – The Java language – Variable Declarations and Arrays – Operators in Java.

Control Statements: An Introduction – Selection Constructs – Iteration Constructs – Jump Constructs .

Introduction to Classes: Instance variables – Class variables – Instance Methods – Constructors – Class Methods – Declaring Objects

UNIT - II

Classes and Methods in Detail: Method Overloading – Constructor Overloading –this Reference – Using Objects in Method – Recursion – Access Modifiers – Inner Classes – Command Line Arguments. Inheritance: Basics of Inheritance – Super Class Variable and Subclass Object – The super reference – Constructor Chaining – Method Overriding – The final Keyword.

Abstract Classes and Interfaces: The abstract Classes and Methods – Defining Interface – Implementing Interfaces – Extending Interface – Interface Reference.

Exception Handling: Types of Exceptions-Uncaught Exceptions – Handling Exceptions – User Defined Exceptions

UNIT - III

Multithreaded Programming: Concept of Threads – Thread Creation – Thread's Life Cycle – Thread Scheduling – Synchronization and Deadlock.

Packages and Access Modifiers: Packages – An Introduction – The package Declaration – The import Statement – Illustration Package – The Java Language Packages.

Handling Strings: Creating Strings – Operations on Strings – Character Extractor Methods – String Comparison Methods

UNIT - IV

Input Output Classes: Input and Output Operations – Hierarchy of classes in java.io Package – File class – InputStream and OutputStream-RandomAccessFile Class.

Applets: Applet Basics – Applet Life Cycle – Running Applets – Methods of the Applet Class

UNIT - V

Abstract Windowing Toolkit: AWT classes – Hierarchy of Classes – Control Fundamentals – Component Class – Basic Component Classes – Various Container Classes – Frame Window in an Applet – Menus. Layout Management and Event Handling: Layout Management Policies – Standard Layout Managers – Handling Events – Hierarchy of Event Classes – Event Delegation Model – Event Classes – Event Listener Interfaces – Adapter Classes

TEXT BOOK:

1. Instructional Software Research and Development (ISRD) Group.2007. "Introduction to Object Oriented Programming through Java", Tata McGraw-Hill Publishing Company Limited, New Delhi.

REFERENCE BOOK:

1. E.BalaGurusamy, 2007. Third Edition." Programming with JAVA – A Primer", Tata McGraw-Hill Publishing Company Limited, Third Edition.

2. John R. Hubbard. 2007. " Schaum's Outline of Programming with Java", Tata McGraw- Hill Publishing Company Limited, Second Edition.

17UCT33P	CORE LAB V : PROGRAMMMING IN JAVA	SEMESTER - III

Hours/Week: 4

Credit Points: 2

CONTENTS

1. Program to implement STACK operations.

2. Program to implement Linked List.

3. Program to implement user define package.

4. Program to implement the concept of multiple inheritance using Interfaces.

5. Program to creating an Exception called payout-of-bounds and throw the exception.

6. Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them.

7. Program to draw several shapes in the created windows.

8. Program to create a frame with four text fields name, street, city and pin code with suitable tables. Also add a button called —my details, When the button is clicked its corresponding values are to be appeared in the text fields.

9. Program to demonstrate the Multiple Selection List-box.

10. Program to create frames which respond to the mouse clicks. For each events with mouse such as mouse up, mouse down, etc., the corresponding message to be displayed.

11. Program to draw circle, square, ellipse and rectangle at the mouse click positions.

12. Program which open an existing file and append text to that file.

17UCT3AA	Allied 3 : DIGITAL LOGIC AND DESIGN	SEMESTER - III

PREAMBLE:

- To understand about digital logic circuits and digital components.

- To learn data representation.

- To understand the central processing unit and its functions.

- To learn I/O organization and devices.

- To understand memory organization.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Learn about digital logic circuits and digital components	K2
2	Understand data representation	K1
3	Learn the central processing unit and its functions	K2
4	Knowledge on I/O organization and devices	K1
5	Knowledge about memory organization	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	S
CO2	M	M	M	M	M
CO3	S	M	S	M	M
CO4	M	M	M	M	M
CO5	S	S	M	M	S

17UCT3AA	Allied 3 : DIGITAL LOGIC AND DESIGN	SEMESTER - III

Hours/Week: 4
Credit Points : 4

CONTENTS

UNIT - I

Digital Logic Circuits: Digital Computers –Logic Gates – Boolean Algebra-Map Simplification- Combinational Circuits- Flip flops

UNIT - II

Digital Components: Integrated Circuits- Decoders – Multiplexers – Registers – Shift Registers- **Data Representation:** Data Types – Complements -Error Detection Codes

UNIT - III

Central Processing Unit: Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes - Data Transfer and Manipulation

UNIT - IV

Input – Output Organization: Peripheral Devices - Input – output interface- Asynchronous data transfer-Modes of Transfer- Priority Interrupt – Direct Memory Access – Input- Output Processor

UNIT - V

   Memory Organization: Memory Hierarchy – Main Memory-Auxiliary Memory - Associative memory- Cache Memory- Virtual Memory
      .

TEXT BOOKS:

1. M. Morris Mano. 1993.Third Edition . "COMPUTER SYSTEM ARCHITECTURE, PHI.

REFERENCE BOOKS:

1. V. K. Puri. 2004. DIGITAL ELECTRONICS CIRCUITS AND SYSTEMS, Tata McGraw Hill Publication.

2. M. Carter. 2006. COMPUTER ARCHITECTURE, Schaum's outline series, Tata McGraw Hill Publication

17UCT3SA	SKILL BASED COURSE 1: WEB TECHNOLOGY	SEMESTER - III

PREAMBLE:

- To understand the concepts of Hyper Text Markup Language

- To know the concept of CSS

- To understand and execute Java Script

- To remember conditional statements, looping statements and arrays concepts

- To know the concept of XML

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Learn the basics of Hyper Text Markup Language	K2
2	Knowledge about the concept of CSS	K1
3	Learn and execute Java Script	K2
4	Remember conditional statements, looping statements and arrays concepts	K1
5	Know about the concept of XML	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	M
CO2	M	S	S	M	M
CO3	M	S	S	M	M
CO4	M	S	M	M	S
CO5	M	M	S	M	M

17UCT3SA	SKILL BASED COURSE 1: WEB TECHNOLOGY	SEMESTER - III

Hours/Week: 4
Credit Points : 4

CONTENTS

UNIT - I

HTML: Introduction to HTML- Classifications of HTML Tags – Structure of HTML Document-Basic HTML Tags-List and its types- Creation of Tables-Table attributes-Linking document-Adding Graphics to HTML Document-Meaning of frames-Creation of Frames-Frame Attributes.

UNIT - II

DHTML: Introduction to CSS-Advantages of CSS-Style Sheet Basics-Methods of Embedding CSS into HTML-Style Sheet properties: Font properties-Text properties-List properties-Color and Background properties-Box Properties-Display properties.

UNIT - III

JAVA Script: Introduction to Java Script-Advantages and uses of Java script-Limitations- Basic syntax of JavaScript- Data types- Variables: Declaration-Scope-Operators and its types.

UNIT - IV

Conditional statement: If Else-switch statement-Looping statement: While loop-Do while –For Loop-Arrays-Functions-Dialog box-sample programs

UNIT - V

Extensible Markup Language: Introduction to XML-Importance of XML –Features of XML –XML Syntax –XML elements-Naming Rules-XML attributes-Document Type Definition- XML document Object Model-XML query Languages-

TEXT BOOK:

1. Dr.P.Rizwan Ahmed "OPEN SOURCE SOFTWARE", Margham Publications

2. M. Sulochana, S. Brinda. 2013. Fourth Edition . "WEB PROGRAMMING",Kalyani Publishers.

REFERENCE BOOKS:

1. Deitel, Deitel, Nieto, Lin & Sadhu. 2001. XML HOW TO PROGRAM, Pearson Education.

17UCT3SP	**SKILL BASED LAB 1 : WEB TECHNOLOGY LAB**	**SEMESTER - III**

Hours/Week: 4
Credit Points : 2

CONTENTS

1. Creating a static web page with multiple links and images.

2. Creating a static web page with forms and frames.

3. Creating a web page using CSS.

4. Creating a XML document that marks up a letter.

5. Creating a XML document for a database with DTD.

6. Creating a Microsoft XML Schema document for any XML document and validate.

7. Creating a XML document with Extensible style sheet.

8. Constructing a DTD and a Corresponding XML document with simple links.

9. Create a Java script program for employee information to find DA, HRA, PF,TAX ,Gross Pay, Deduction and Net Pay

10. Create a java script program to calculate mark and grade of students using three subjects

11. Write a java script program to display current day, month and year

12. Create a webpage with dynamic effects using java script to include basic animation

17UCT43A	CORE V: OPERATING SYSTEM	SEMESTER - IV

PREAMBLE:

- To gain knowledge on evolution of OS functions.

- To learn on scheduling and deadlock techniques.

- To obtain knowledge on processes, process synchronization and inter-process communication.

- To remember memory management and file systems.

- To obtain knowledge on Linux

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Knowledge on evolution of OS functions.	K2
2	Learn scheduling and deadlock techniques.	K2
3	Knowledge on processes, process synchronization and inter-process communication.	K1
4	Remember memory management and file systems.	K2
5	Knowledge on Linux	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	S
CO2	M	S	S	M	M
CO3	M	S	M	M	S
CO4	S	M	M	S	M
CO5	M	M	M	M	S

17UCT43A	CORE V: OPERATING SYSTEM	SEMESTER - IV

Hours/Week: 6
Credit Points : 5

CONTENTS

UNIT - I

Evolution of OS Functions: OS Functions-Evolution of OS functions-Batch processing systems-Multiprogramming systems-Time sharing systems-Real time operating systems-OS structure.

Processes: Process definition – Process Control- Interacting Processes-Implementation of Interacting Processes-Threads.

UNIT - II

Scheduling: Scheduling policies-Job scheduling-Process Scheduling - Process management in Unix - Scheduling in multiprocessor OS.

Deadlocks: Definition-Resource status modeling-Handling deadlocks-Deadlock detection and resolution-deadlock Avoidance-Mixed approach to deadlock handling.

UNIT - III

Process Synchronization: Implementing control synchronization-Critical sections-Classical process synchronization problems-Evolution of Language features for process synchronization-Semaphores-Critical regions-Conditional critical regions-Monitors.

Inter-process Communication: Inter-process messages-Implementation issues- Mailboxes

UNIT - IV

Memory Management: Memory allocation preliminaries-Contiguous memory allocation-Non contiguous memory allocation-Virtual memory using paging-Virtual memory using segmentation.

File Systems: Directory Structures-File production-Allocation of Disk space-Implementing file access-File sharing-File system reliability.

UNIT - V

UNIX & LINUX: History & their features, File system Architecture Details, Types of users and files in UNIX/LINUX- Basic LINUX/UNIX Commands, File Related Commands, Others Linux commands.

Files and Permissions: An Analysis, Wildcard Symbols, Redirection Operators, Filter-GREP , Pipe.

Shell Programming : An Introduction, Syntax and Variables Used in Shell Scripting.

TEXT BOOK:

1. D M Dhamdhere . 2009. 2nd Revised Edition ,"SYSTEMS PROGRAMMING AND OPERATING SYSTEMS", Tata McGraw-Hill Publishing.

2. D.P.Kothari, Shriram K Vasudevan, Sundaram R M D, Subashri V,2012, 1st Edition, "LINUX", New Age International Publishers.

REFERENCE BOOK:

1. *Leland L. Beck*. Third Edition. 2003. SYSTEM SOFTWARE-AN INTRODUCTION TO SYSTEMS PROGRAMMING, Pearson Education Publishers.

2. *H.M. Deitel.* Second Edition. 2003. OPERATING SYSTEMS, Pearson Education Publication.

3. *Achyut S. Godbole.* 2002. OPERATING SYSTEMS , Tata McGraw Hill Publications.

17UCT43B	CORE VI: RELATIONAL DATA BASE MANAGEMENT SYSTEM	SEMESTER - IV

PREAMBLE:

- To understand the basic concepts of database concepts, database design and data modeling and normalization.
- To acquire knowledge on database environment.
- To identify the DML commands.
- To expose the concepts of PL/SQL
- To analyze the various composite data types.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand the basic concepts of database concepts, database design and data modeling and normalization.	K1
2	Obtain knowledge on database environment.	K2
3	Know the DML commands.	K2
4	Learn the concepts of PL/SQL	K3
5	Analyze the various composite data types.	K4

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	S
CO2	M	M	M	M	M
CO3	M	M	S	M	S
CO4	M	S	M	M	M

CO5	M	M	S	M	S

17UCT43B	**CORE VI: RELATIONAL DATA BASE MANAGEMENT SYSTEM**	**SEMESTER - IV**

Hours/Week: 6
Credit Points : 5

CONTENTS

UNIT - I

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. **Database Design: Data Modeling and Normalization:** Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De -normalization – Another Example of Normalization.

UNIT - II

Oracle9i: Oracle9i: Oracle9i an introduction – SQL. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

UNIT - III

Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables –

DEFINE command – CASE structure. **Functions and Grouping:** Built-in functions –Grouping Data. **Multiple Tables: Joins and Set operations:** Join – Set operations.

UNIT - IV

PL/SQL: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. **Control Structures and Embedded SQL:** Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. **PL/SQL Cursors and Exceptions:** Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Exceptions – Types of Exceptions.

UNIT - V

PL/SQL Composite Data Types: Records – Tables – arrays. **Named Blocks:** Procedures – Functions – Packages –Triggers.

TEXT BOOKS:

1. Nilesh Shah .2011. 2nd edition DATABASE SYSTEMS USING ORACLE, PHI.

REFERENCE BOOKS:

1. Arun Majumdar & Pritimoy Bhattacharya. 2007. DATABASE MANAGEMENT SYSTEMS , TMH.

17UCT43P	CORE LAB VI: RELATIONAL DATA BASE MANAGEMENT SYSTEM	SEMESTER - IV

Hours/Week: 4
Credit Points : 2

CONTENTS

1. a) Create DEPARTMENT, DESIGNATION, EMPLOYEE tables with required constraints.

DEPARTMENT :Deptid (pk) : varchar2, Deptname (nn) : varchar2

DESIGNATION :Desid (pk): varchar2, Designation (nn): varchar2

EMPLOYEE :

Empid(pk): varchar2

Empname (nn): varchar2

Deptid(fk): varchar2

Desid(fk): varchar2

Gender(nn): char

Dob (nn): date

Doj (nn): date

Contactnumber: number

Bpay (nn): number

1.b) Add a new column mailid of varchar type in the EMPLOYEE table

2.a) Insert necessary records in the above tables.

2.b) Update the designation id of the employee with empid 'e5' as 'CLS'.

3.a) Display the details of the employees whose designation is manager.

3.b) Display the employee details in ascending order based on their name.

4.a) Find the maximum salary of the employee of each department.

4.b) Display the name of the employee and their designation.

5) Create a view to display the details of the employee whose designation is junior assistant in sales department.

6) Create a report to display the details of the employee of the accounts department.

7) Create a cursor to display all employee IDs and names from the EMPLOYEE table.

8) Write a procedure to update the basic pay.

Senior Manager: 25% , Junior Manager : 20% , Junior Clerk: 15%, Senior Clerk: 12%, Senior Assistant: 10%, Junior Assistant: 8%.

9) Create a function to find sum of salaries of all employees working in sales department.

10) Write a database trigger before delete for each row not allowing deletion on employee table and give appropriate message.

11) Write a Database trigger before insert for each row on the table EMPLOYEE not allowing transaction on Saturday / Sunday.

12) Display the constraint details of all the above three tables.

17UCT43Q	CORE LAB VII: PROGRAMMING IN LINUX	SEMESTER - IV

Hours/Week:4
Credit Points : 2

CONTENTS

1. Create Shell script to stimulate the file commands: rm, cp, cat, mv, cmp, wc, split, diff.
2. Create Shell script to show the following system configuration :
   a. currently logged user and his log name
   b. current shell , home directory , Operating System type , current Path setting ,current working directory
   c. show currently logged number of users, show all available shells
   d. show CPU information like processor type , speed
   e. show memory information
3. Create Shell Script to implement the following: pipes, Redirection and tee commands.
4. Create Shell script for displaying current date, user name, file listing and directories by getting user choice.
5. Create Shell script to implement the filter commands.
6. Create Shell script to remove the files which has file size as zero bytes.
7. Create Shell script to find the sum of the individual digits of a given number.
8. Create Shell script to find the greatest among the given set of numbers using command line arguments.
9. Create Shell script for palindrome checking.
10. Create Shell script to print the multiplication table of the given argument using for loop

17UCT4AA	ALLIED 4 : SOFTWARE TESTING	SEMESTER - VI

PREAMBLE:

- To obtain knowledge on software development life cycle models and white – box testing concept.
- To learn black – box testing and integration testing.
- To learn system acceptance testing.
- To obtain performance testing and regression testing.
- To understand deep knowledge test planning and test metrics.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Knowledge on software development life cycle models and white – box testing concept.	K2
2	Understand black – box testing and integration testing.	K2
3	Learn system acceptance testing.	K2
4	Ability to obtain knowledge on performance testing and regression testing.	K2
5	To understand deep knowledge test planning and test metrics.	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	M	M
CO2	M	S	M	M	S
CO3	M	S	M	M	M
CO4	M	M	S	S	S
CO5	M	M	M	M	S

17UCT4AA	ALLIED 4 : SOFTWARE TESTING	SEMESTER - VI

Hours/Week: 6
Credit Points : 4

CONTENTS

UNIT - I

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. **White-Box Testing**: Static Testing – Structural Testing – Challenges in White-Box Testing.

UNIT - II

Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - **Integration Testing**: Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash

UNIT - III

System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

UNIT - IV

Performance Testing: Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing**: What

is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT - V

Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements**: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

TEXT BOOK:

1. Srinivasan Desikan, Gopalswamy Ramesh. 2006. SOFTWARE TESTING PRINCIPLES AND PRACTICES, Pearson Education.

REFERENCE BOOK:

1. WilliamE.Perry. 2007. 3rd Edition. EFFECTIVE METHODS OF SOFTWARE TESTING, Wiley India.
2. Renu Rajani, Pradeep Oak. 2007. SOFTWARE TESTING, TMH.

17UCT53A	CORE VII : DATA COMMUNICATION AND NETWORKS	SEMESTER - V

PREAMBLE:

- To gain knowledge on data communications and transmission methods.

- To understands modes of data transmission, transmission media and network topologies.

- To remember OSI layers, routing algorithms and ISDN architecture.

- To obtain knowledge on internetworking devices and analyze the problems in internetworking.

- To remember TCP and UDP communication and application level protocols.

Course Outcome

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

CO No.	CO. Statement	Knowledge Level
1	Know about data communications and transmission methods	K2
2	Describe modes of data transmission, transmission media and network topologies	K3
3	Memorize OSI layers, routing algorithms and ISDN architecture	K2
4	Know about internetworking devices and problems in internetworking	K2
5	Remember TCP and UDP communication and classify various application level protocols	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	S	M	M	M
CO3	M	M	S	S	S
CO4	M	M	M	M	S
CO5	M	S	M	S	S

17UCT53A	CORE VII : DATA COMMUNICATION AND NETWORKS	SEMESTER - V

Hours/Week: 5
Credit Points : 5

CONTENTS

UNIT - I

Introduction to Data Communications and Networking – Information Encoding – Analog and Digital Transmission Methods.

UNIT - II

Modes of Data Transmission and Multiplexing -**Transmission Errors**: Introduction –Error Classification -Types of error- Error Detection and Correction

Transmission Media: Guided Media, Unguided Media – **Network Topologies:** Mesh, Star, Tree, Ring, Bus – Switching: Circuit switching, Message switching, Packet switching.

UNIT - III

Routing Algorithms: Routers and Routing – Factors affecting Routing Algorithms – Routing Algorithms-Network Protocols and OSI Model-Integrated Services Digital Network (ISDN).

UNIT - IV

Internetworking Concepts: Introduction – The Problems in Internetworking - Internetworking Devices- Introduction to TCP / IP, IP, ARP, RARP, ICMP

UNIT - V

TCP: Features of TCP, Relationship between TCP and IP, Ports and Sockets, TCP connections, What makes TCP Reliable, TCP Packet Format – **User Datagram Protocol (UDP):** UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – File Transfer Protocol (FTP) .

TEXT BOOK:

1. Achyut S.Godbole. 2007 . DATA COMMUNICATIONS AND NETWORKS, Tata McGraw Hill Publications.

REFERENCE BOOK:

1. Behrouz A. Forouzan. 19th reprint, 2007. DATA COMMUNICATIONS AND NETWORKING – SECOND EDITION UPDATE, Tata McGraw-Hill Publication.
2. Andrew S. Tanenbaum. 3rd Edition, 2000. COMPUTER NETWORKS, Prentice Hall of India.

17UCT53B	CORE VIII : C#.NET PROGRAMMING	SEMESTER - V

PREAMBLE:

- To Understand the .NET Environment

- To remember arrays , strings , structure and classes and objects

- To remember inheritance ,polymorphism, operator overloading and understand delegates

- To learn Exceptions ,multithread and web based applications

- To know the web form components

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Obtain knowledge on .NET platform	K2
2	Remember arrays, strings, structure and classes and objects	K1
3	Remember inheritance, polymorphism, operator overloading and understand delegates	K1
4	Learn Exceptions, multithread and web based applications	K2
5	Know the web form components	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT53B	CORE VIII : C#.NET PROGRAMMING	SEMESTER - V

Hours/Week: 5
Credit Points : 5

CONTENTS

UNIT – I

Understanding .NET: The C# environment - Over view of C# - Literals, Variables and Data Types - Methods in C# -Operators -Control Statements – Branching and Looping statement.

UNIT – II

Handling Arrays-Manipulating Strings - Structures and Enumerators -Classes and Objects.

UNIT – III

Inheritance and Polymorphism- Interface: Multiple Inheritance - Operator Overloading - Delegates and Events- Managing Errors and Exceptions.

UNIT - IV

Windows and Web-based Application Development on .NET - Web Forms in C# - Buttons – Text boxes - Labels – Literals – File Upload - Place holders – Check box – Radio buttons – Tables – Panels – Images – Image Buttons – Image Maps – List boxes – Drop-down list – hyperlinks – link buttons – Tree view – Menu – Validation Controls – Validation Groups

UNIT – V

Architecture of ADO.NET- Connected and Disconnected database – Working with Data Binding and Data sets.

TEXT BOOKS:

1. Balagurusamy, E. 2010. "Programming in C# A Primer, [III Edition], Tata McGraw Hill.(Unit I,II,III)

2. Matt Telles ,"C# 2005 Programming - Black Book", dreamtech press. (Unit IV)

3. John Sharp, 2013." Visual C# 2005 step by step" , Microsoft, Prentice Hall of India (P) Ltd.,(V)

REFERENCE BOOKS:

1. Art Gittleman.2008. C#.Net Illustrated Viva Bark Pvt Ltd

2. Geff Ferguson .2007. C# Programming Bible[1st Edition] Willy India

17UCT53P	**CORE LAB VIII :** **PROGRAMMING IN C#.NET**	**SEMESTER - V**

Hours/Week:4
Credit Points : 2

CONTENTS

1. Create a C# program implementing the various types of parameters.

2. Create a C# program demonstrating boxing and unboxing.

3. Create a C# program to find the sum of all the elements present in a jagged array.

4. Create a C# program demonstrating Operator Overloading.

5. Create a C# program in C# to demonstrate error handling.

6. Create a C# program implementing overriding methods.

7. Create a C# program implementing interface.

8. Create a C# program implementing properties.

9. Create a C# program demonstrating delegates and events.

10. Develop a C# application for a simple Quiz.

11. Develop a C# application implementing control validators.

12. Develop a C# application for Student detail manipulation.

17UCT53Q	CORE LAB IX : NETWORK LAB	SEMESTER - V

Hours/Week:4
Credit Points : 2

CONTENTS

1 .Program to Detect Errors using Vertical Redundancy Check (VRC).

2. Program to Detect Errors using Longitudinal Redundancy Check (LRC).

3. Program to Detect Errors using Cyclic Redundancy Check (CRC).

4. Socket program to implement Asynchronous Communication.

5. Socket program to implement Isochronous Communication.

6. Program to implement Stop & Wait Protocol.

7. Program to implement Sliding Window Protocol.

8. Program to implement Remote Procedure call under Client / Server Environment

17UCT5SB	SKILL BASED COURSE 2: ANDROID TECHNOLOGY	SEMESTER - V

PREAMBLE:

- To obtain knowledge on android environment

- To learn components and layouts.

- To learn design interface tools.

- To obtain knowledge on activity

- To know about JSON

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Knowledge on android environment	K2
2	Learn components and layouts	K1
3	Learn design interface tools	K1
4	Acquire Knowledge on activity	K2
5	Know about JSON	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT5SB	SKILL BASED COURSE 2: ANDROID TECHNOLOGY	SEMESTER - V

Hours/Week: 4
Credit Points : 4

CONTENTS

UNIT - I

Introduction to Android OS : What is android ? – android ecosystem-why android? – versions- activity- features- Architecture- Stack Linux Kernel. Configuration of Android Environment: Operating System – Java JDK- Android SDK- Android Development Tools(ADT)- Android Virtual Devices(AVD)-Emulators- Dalvik Virtual Machine-difference between JVM and DVM-Steps to install and configure Eclipse and SDK.

UNIT - II

Directory Structure - Android User Interface: Understanding the Components on Screen- Linear layout-absolute layout-frame layout-Relative layout- Table layout.

UNIT - III

Designing user Interface with View: Text view-button – Image button - Edit text- Check box-Toggle button- Radio button and Radio group-Progress bar-Text View-Spinner-List View –Grid View- Image View-Scroll View-Custom toast alert-Time and Date Picker.

UNIT - IV

Activity: Introduction – Intent - Intent filter-Activity life cycle-Broadcast life cycle services—Multimedia-Android System Architecture-Play Audio and Video-Text and Speech.

UNIT - V

JSON: what is JSON?-XML and JSON- use of JSON-syntax and rule of JSON- JSON name/value pairs –JSON values-objects –array-How to JSON use java script syntax-parsing JSON and XML.

TEXT BOOK:

1. Prasannakumar Dixit , 2014,"Android", Vikas Publishing House Private Limited.

17UCT5SP	**SKILL BASED LAB 2 : ANDROID TECHNOLOGY LAB**	**SEMESTER - V**

Hours/Week: 4
Credit Points : 2

CONTENTS

1. Java Android Program to Change the Image Displayed on the Screen
2. Java Android Program to Demonstrate Tip Calculator
3. Java Android Program to Demonstrate Linkify Class in Android
4. Java Android Program to Demonstrate Toast in an Application
5. Java Android Program to Demonstrate a Simple Video View
6. Java Android Program to Demonstrate Shape Drawables
7. Java Android Program to Demonstrate Date Picker Dialog in Android
8. Java Android Program to Cancel an Alarm Intent

17UCT63A	CORE IX : OPEN SOURCE TOOLS	SEMESTER - VI

PREAMBLE:

- To understand basics of PHP

- To learn functions and objects in PHP.

- To understand working with MySQL database using PHP.

- To learn fundamental concepts of Python language

- To remember the core functions and techniques used in Python

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand basics of PHP	K2
2	Learn functions and objects in PHP.	K1
3	Understand working with MySQL database using PHP.	K2
4	Learn fundamental concepts of Python language	K1
5	Remember the core functions and techniques used in Python	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

| 17UCT63A | CORE IX : OPEN SOURCE TOOLS | SEMESTER - VI |

Hours/Week: 5

Credit Points : 5

CONTENTS

UNIT - I

Introduction to PHP: Incorporating PHP within HTML – The Structure of PHP. Expressions and Control flow in PHP: Expressions – Operators – Conditionals – Looping – Implicit and Explicit Casting.

UNIT - II

PHP Functions and Objects: PHP Functions – Including and Requiring Files – PHP Version Compatibility – PHP Objects. PHP Arrays: Basic Access – The foreach… as Loop – Multidimensional Arrays.

UNIT - III

Working with Database and Tables: Creating Databases – Creating Tables Altering Tables – Backup and Restoring Databases and Tables – Dropping Databases and Tables – Viewing Databases, Table and Field Information. Editing Records and performing Queries: Inserting Records – Editing and Deleting Records – Performing Queries: Retrieving Specific Columns – Filtering Records with a WHERE Clause. Querying a MYSQL Database with PHP: Using MYSQL and PHP Together – Managing Database Connections – Performing Queries – Processing Result Sets.

UNIT - IV

Introduction – Lexical Conventions and Syntax: Identifiers and Reserve Words – Literals – Operators, Delimiters and Special Symbols. Types and Objects: Built in Types – Special Methods. Operators and Expressions – Control Flow: Conditionals – Loops and Iterations – Exceptions.

UNIT - V

Functions and Functional Programming – Classes and Object Oriented Programming – Input and Output – String and Text Handling – Threads.

TEXT BOOKS:

1. Robin Nixon, "Learning PHP, MYSQL, JavaScript, CSS & HTML 5", O'REILLY, Fourth Edition 2014 (Unit I & II).

2. Vikram Vaswani, "PHP and MySQL", McGraw Hill Education, 2005 (Unit III).

3. David Beazley, "Python Essential Reference", Sams Publishing, Third Edition, 2006 (Unit IV & V).

REFERENCE BOOKS:

1. The PHP Complete Reference, Steven Holzner, McGraw Hill Education, First Edition 2007.

2. PHP: A Beginner's Guide, Vikram Vaswani, McGraw Hill Education, First Edition 2009.

3. Guido Van Rossum and Fred L. Drake Jr, "An Introduction to Python", published by Network Theory Ltd., 2011.

17UCT63B	CORE X : NETWORK SECURITY AND CRYPTOGRAPHY	SEMESTER – V1

PREAMBLE:

- To understand the various risks involved with network computers
- To acquire the knowledge various security tools and techniques
- To develop the skill of cryptography and algorithms.
- To identify various internet security protocols, user authentication and Kerberos.
- To analyze importance Database security and Virtual area network.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand the various risks involved with network computers	K2
2	Acquire the knowledge various security tools and techniques	K1
3	Develop the skill of cryptography and algorithms.	K1
4	Identify various internet security protocols, user authentication and Kerberos.	K2
5	Analyze importance Database security and Virtual area network.	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT63B	**CORE X : NETWORK SECURITY AND CRYPTOGRAPHY**	**SEMESTER – V1**

Hours/Week: 5
Credit Points : 5

CONTENTS

UNIT - I

Attacks on computers and computer security: Introduction –Need for security – Security approaches -principles of security –Types of attacks. **Cryptography :** Concepts and techniques - introduction – plain text and cipher text –substitution techniques - transposition techniques encryption and decryption - symmetric and asymmetric key cryptography-possible type of attacks.

UNIT - II

Symmetric Key Algorithms and AES: Introduction - Algorithm Types and modes – An overview of symmetric key cryptography – Data encryption Standard (DES) – International Data Encryption Algorithm (IDEA)-Advanced Encryption Standard (AES) **Asymmetric Key Algorithms**: RSA - Digital Signature

UNIT - III

Digital certificate: Introduction – digital certificates. **Internet Security Protocols** : Introduction – basic concepts – Secure Socket Layer – (SSL) – Transport Layer Security(TLS) – Secure Hyper Text Transfer Protocol (SHTTP) – Time Stamping Protocol (TSP) – Secure Electronic Transaction (SET) – SSL Versus SET – 3-D secure Protocol – Electronic Money - Email security – Wireless Application Protocol (WIP)

UNIT - IV

User Authentication and Kerberos: Introduction – Authentication basics - Passwords – Authentication Tokens – Certificate based Authentication – biometric authentication – Kerberos – Key distribution centre – Security handshake Pitfalls – Single sign on (SSO) Approaches.

UNIT - V:

Data Base Security- Network Security Firewalls - **Virtual Private Networks (VPN):** Introduction – Brief introduction to TCP/IP – Fire walls – IP security – Virtual Private networks (VPN) – Intrusion.

TEXT BOOK:

1. Atul Kahate. Second Edition. 2003. CRYPTOGRAPY AND NETWORK SECURITY, Tata McGraw-Hill.

17UCT63P	CORE LAB X : OPEN SOURCE TOOLS LAB	SEMESTER - VI

Hours/Week: 5
Credit Points : 2

1. Create PHP program to find if the given year is leap year or not.

2. Create PHP program to add two numbers using Functions.

3. Design a web page that should compute one's age on a given date.

4. Program to upload a file in PHP

5. Program using Include () and Session ().

6. Create a Database 'Marks' with two tables to perform Insertion, Updation and Deletion operations of rows in MYSQL Database.

7. Design an authentication web page in PHP with MySQL to check username and password.

8. Program to find the GCD of two numbers using user-defined functions using Python.

9. Program to perform change, add, append and extend elements to a list using Python.

10. Program to perform string manipulation using Python.

11. Program to access a range of items in a tuple by using slicing operator using Python.

12. Program to perform exception handling mechanism using Python.

17UCT63V	CORE XI : PROJECT WORK LAB	SEMESTER - VI

Hours/Week: 5
Credit Points : 4

1. Each student should carry out individually one Project Work and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.

2. The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned

3. No candidate will be allowed to change the title of the Project work.

4. Final Viva-Voce will be conducted Both the Internal (Respective Guides) and External Examiners (20+55).

ELECTIVE SUBJECT SYLLABUS

17UCT5EA	ELECTIVE I : MIDDLEWARE TECHNOLOGIES	SEMESTER - V

PREAMBLE:

- To learn architecture of client/server
- To know about presentation services
- To study the component model
- To learn ASP.NET
- To know about ADO connectivity

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Learn architecture of client/server	K2
2	Know about presentation services	K1
3	Study the component model	K1
4	Learn asp.net	K2
5	Know about ado connectivity	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT5EA	ELECTIVE I : MIDDLEWARE TECHNOLOGIES	SEMESTER - V

Hours/Week: 4
Credit Points : 4

CONTENTS

UNIT - I

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

UNIT - II

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB

UNIT - III

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB

UNIT - IV

CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB – Building an application with CORBA.

UNIT - V

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – Interface Pointers – Object Creation, Invocation, Destruction – Comparison COM and CORBA.

TEXT BOOKS:

1.   Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd., 2002. (Unit 1)

2.   Tom Valesky, "Enterprise Java Beans",Pearson Education, 2008.(Unit 2 & 3)

3.   Jason Pritchard, "COM and CORBA side by side", Addison Wesley, 2000
 (Unit 4 & 5)

17UCT5EB	ELECTIVE I: CLOUD COMPUTING	SEMESTER - V

PREAMBLE:

- To understand the basics, benefits, limitations of Cloud computing
- To understand the concepts of Cloud infrastructure
- To obtain knowledge on cloud platforms
- To understand about cloud computing services
- To gain knowledge on developing cloud applications

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand the basics, benefits, limitations of Cloud computing	K2
2	Understand the concepts of Cloud infrastructure	K1
3	Knowledge on cloud platforms	K1
4	Understand about cloud computing services	K2
5	Knowledge on developing cloud applications	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

| 17UCT5EB | ELECTIVE I: CLOUD COMPUTING | SEMESTER - V |

Hours/Week: 4
Credit Points:4

CONTENTS

UNIT - I

Cloud Computing Basics - Cloud Computing Overview-Applications-Intranets and the cloud-First Movers in the cloud. When you can use cloud computing-benefits-Limitations – Security concerns.

UNIT - II

Cloud Computing Services –operational, economic, staffing benefits – Thomson Reuters. Cloud Computing Technology: Hardware and Infrastructure : Clients – Security-Network-Services

UNIT - III

Accessing the cloud: Platforms – web applications – Web API- Web browsers. Cloud Storage: Overview- providers – Standards: Applications-Client – Infrastructure-Service.

UNIT - IV

Cloud Computing at work: Software as a Service: overview – driving forces - company offerings – industries. Software Plus Services : Overview – Mobile device integration – Providers –Microsoft Online

UNIT - V

Developing Applications : Google-Microsoft-Intuit Quick Base- Cast Iron Cloud –Bungee Connect- Development –trouble shooting –Application Management-Virtualizations –Server solutions-Cloud Service-Best Practices

TEXT BOOK

1. Anthony T.Velte, Toby.J.Velte, Robert Elsenpeter.2009. CLOUD COMPUTING- A LAB APPROACH , Tata McGraw-Hill

| 17UCT6EA | ELECTIVE II : MOBILE COMPUTING | SEMESTER - VI |

PREAMBLE:

- To understand the basics of mobile computing

- To obtain knowledge on cellular phones, satellite communication, WLANs, Bluetooth and protocols

- To study on wireless communication systems and to remember various standards

- To obtain knowledge on cellular networks

- To acquire wider knowledge on CDMA and GSM

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand the basics of mobile computing	K2
2	Knowledge on cellular phones, satellite communication, WLANs, Bluetooth and protocols	K1
3	Study on wireless communication systems and to remember various standards	K1
4	Knowledge on cellular networks	K2
5	Acquire wider knowledge on CDMA and GSM	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

| 17UCT6EA | ELECTIVE II : MOBILE COMPUTING | SEMESTER - VI |

Hours/Week: 5
Credit Points : 4

CONTENTS

UNIT - I

Introduction to mobile computing – Introduction – Evolution of mobile computing – types – mobile communication – applications of mobile computing – advantages and limitations.

UNIT - II

Cellular phones – mobile telephone systems – satellite communication – wireless LANs – Bluetooth – protocols.

UNIT - III

Wireless communication systems – introduction – spectrum allocation – 2G / 2.5G / 3G / 4G wireless networks and standards: AMPS – FDMA – DAMPS – TDMA – GSM GPRS – Wireless networks and standards.

UNIT - IV

Cellular networks: Introduction – mobile radio propagation – basic cellular network structure – operations of cellular networks – digital modulation for cellular networks – multiple access schemes of cellular networks

UNIT - V

CDMA – What is GSM? – Why GSM? – GSM Protocol stack – GSM architecture – location tracking and call setup – security – GSM services – SMS architecture and protocol hierarchy.

TEXT BOOK:

1. Er. Gurjeet Singh, Er. Rachhpal Singh, Er. Amardeep Singh, "Mobile Computing", Kalyani publishers, 2012.

17UCT6EB	ELECTIVE II: BIG DATA AND ANALYTICS	SEMESTER - VI

PREAMBLE:

- To understand digital data
- To know about data science and analytics
- To acquire knowledge NoSQL
- To understand the concepts of Hadoop
- To study the Hadoop file System

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand digital data	K2
2	Know about data science and analytics	K1
3	Acquire knowledge NoSQL	K1
4	Understand the concepts of Hadoop	K2
5	Study the Hadoop file System	K2

1. **Mapping with Programme Outcomes**
2.

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT6EB	ELECTIVE II: BIG DATA AND ANALYTICS	SEMESTER - VI

Hours/Week: 5
Credit Points : 4

CONTENTS

UNIT - I

Types of Digital data: Classification of Digital Data-Introduction to Big Data: Definition-Challenges – what is big data?-why big data- traditional business intelligence (BI) vs big data- A typical data warehouse environment – a typical Hadoop environment- what is new today? –what is changing in the realm of big data?

UNIT - II

Big data analytics –Classification of Analytics - Data Science – Terminologies used in Big Data Environment

UNIT - III

The Big Data Technology Landscape: NoSQL-Types – Advantages – use of NoSQL in industry- NoSQL vendors- comparsion SQL, NoSQL and NewSQL. Hadoop: Features-Advantages – Version-Overview-Distributors-Hadoop Vs SQL-cloud based Hadoop solutions

UNIT - IV

Introduction to Hadoop: Introducing Hadoop- why Hadoop- why not RDBMS-RDBMS Vs Hadoop- Distributors computing challenges- History of Hadoop- Overview –Use case of Hadoop- Hadoop distributors

UNIT - V

HDFS: Hadoop Distributed File System-HDFS daemons-Anatomy of file read-Anatomy of file write- placement strategy-Working with Hadoop command-Special feature-Processing data with Hadoop-Managing resource and application with Hadoop YARN- Interaction with Hadoop ecosystem

TEXT BOOK:

1. Seema Acharya, Subhashini chellappan, "Big Data and Analystics", WILEYINDIA publication, 2015.

17UCT6EC	ELECTIVE III: INTERNET OF THINGS	SEMESTER - VI

PREAMBLE:

- To Vision and Introduction to IoT.

- To Understand IoT Market perspective.

- To Know about Data and Knowledge Management and use of Devices in IoT Technology.

- To Understand State of the Art – IoT Architecture.

- To Learn Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Vision and Introduction to IoT.	K2
2	Understand IoT Market perspective.	K1
3	Know about Data and Knowledge Management and use of Devices in IoT Technology.	K1
4	Understand State of the Art – IoT Architecture.	K2
5	Learn Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT6EC	ELECTIVE III: INTERNET OF THINGS	SEMESTER - VI

Hours/Week: 5
Credit Points : 4

CONTENTS

UNIT - I

M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.

UNIT - II

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT - III

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management

UNIT - IV

IoTArchitecture-State of the Art – Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference Model-IoT Reference Architecture-

Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

UNIT - V

Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control. Industrial Automation- Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, Commercial Building Automation- Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

TEXT BOOK:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

REFERENCE BOOK:

1. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014.
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, A press Publications, 2013

17UCT6ED	ELECTIVE III: GRAPHICS AND MULTIMEDIA	SEMESTER - VI

PREAMBLE:

- To understand various output primitives
- To acquire the knowledge of 2D
- To analyze the text and image concepts
- To identify the fundamental characteristics of Audio & Video
- To develop skills in animation & compression methods

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Understand various output primitives	K2
2	Acquire the knowledge of 2D	K1
3	Analyze the text and image concepts	K1
4	Identify the fundamental characteristics of Audio & Video	K2
5	Develop skills in animation & compression methods	K2

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	S
CO2	M	S	M	M	S
CO3	S	M	S	M	S
CO4	M	S	M	M	M
CO5	S	M	S	M	M

17UCT6ED	ELECTIVE III: GRAPHICS AND MULTIMEDIA	SEMESTER - VI

Hours/Week: 5
Credit Points : 4

CONTENTS

UNIT - I

Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms. **Attributes of Output Primitives:** Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

UNIT - II

2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. **2D Viewing:** The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations.

UNIT - III

Text: Types of Text – Unicode Standard – Font – Insertion of Text -Text compression – File formats. **Image:** Image Types – Seeing Color – Color Models – Basic Steps for Image Processing –Scanner – Digital Camera – Interface Standards – Specification of Digital Images – CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.

UNIT - IV

Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Basics of Staff Notation – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Recording Systems – Audio and Multimedia – Voice Recognition and Response - Audio Processing Software.

UNIT - V

Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats –Television Broadcasting Standards – PC Video – Video File Formats and CODECs – Video Editing –Video Editing Software.

Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web – Special Effects – Rendering Algorithms.

Compression: MPEG-1 Audio – MPEG-1 Video - MPEG-2Audio –MPEG-2 Video.

TEXT BOOKS:

1. Donald Hearn, M.Pauline Baker. 2001. 2nd edition. "COMPUTER GRAPHICS", PHI. (UNIT-I: 3.1-3.6,4.1-4.5 & UNIT-II: 5.1-5.4,6.1-6.5)

2. Ranjan Parekh.2007."PRINCIPLES OF MULTIMEDIA", TMH. (UNIT III: 4.1-4.7,5.1-5.16 UNIT-IV: 7.1-7.3,7.8-7.14,7.18-7.20,7.22,7.24,7.26-28 UNIT-V: 9.5-9.10,9.13,9.16,10.10-10.13)

REFERENCE BOOKS:

1. Amarendra N Sinha, Arun D Udai. 2008."COMPUTER GRAPHICS", TMH.
2. Tay Vaughan.Seventh Edition. 2006." MULTIMEDIA: Making it Work", TMH.

NON MAJOR ELECTIVE COURSE SYLLABUS

17UED34K	NON MAJOR ELECTIVE 1: MULTIMEDIA	SEMESTER - III

PREAMBLE:

- To understand basics of multimedia.
- To understand the text and image concepts.
- To identify the fundamental characteristics of Audio & Video.
- To develop skills on audio / video tools and softwares
- To understand animation methods.

Course Outcomes

CO No.	CO. Statement	Knowledge Level
1	Understand basics of multimedia.	K1
2	Understand the text and image concepts.	K1
3	Identify the fundamental characteristics of Audio & Video.	K2
4	Develop skills on audio / video tools and softwares	K4
5	Understand animation methods.	K1

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1		S	M		
CO2			M		M
CO3		S			
CO4			S		
CO5			S		M

17UED34K	NON MAJOR ELECTIVE 1: MULTIMEDIA	SEMESTER - III

Hours/Week: 2
Credit Points : 2

CONTENTS

UNIT - I

Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats

UNIT - II

Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera

UNIT - III

Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Sound Card – Audio Transmission – Audio File formats

UNIT - IV

Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – PC Video – Video File Formats and CODECs – Video Editing – Video Editing Software.

UNIT - V

Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web

TEXT BOOK:

1. Ranjan Parekh. 2007. PRINCIPLES OF MULTIMEDIA, TMH.

17UED44K	NON MAJOR ELECTIVE 2: ORACLE	SEMESTER - IV

PREAMBLE:

- To understand the basic concepts of data base.

- To acquire the knowledge of DDL commands.

- To identify the DML commands.

- To experiments the various operations involved in table.

- To create the outline of data base

Course Outcomes

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

CO No.	CO. Statement	Knowledge Level
1	Acquire the knowledge of data base.	K2
2	Ability to design data model in ORACLE	K2
3	Ability to construct queries in ORACLE.	K2
4	Work with DML commands.	K3
5	Understand various operations in tables.	K2

Mapping with Programme Outcomes

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1		M			M
CO2			S		
CO3		S			M
CO4			S		
CO5		S			M

17UED44K	**NON MAJOR ELECTIVE 2: ORACLE**	**SEMESTER - IV**

Hours/Week: 2
Credit Points:2

CONTENTS

UNIT - I

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages.

UNIT - II

Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

UNIT - III

Working with Table: Data Management and Retrieval: DML Commands adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table

UNIT - IV

Arithmetic Operations – restricting Data with WHERE clause – Sorting

UNIT - V

 DEFINE command – Multiple Tables: Joins and Set operations: Join – Set operations.

TEXT BOOK:

1. Nilesh Shah.2005. 2nd edition. DATABASE SYSTEMS USING ORACLE, PHI.

தமிழ் - தாள் -1 & தமிழ் - தாள் - 2

வினாத்தாள் அமைப்புமுறை

நேரம்: 3 மணி   மதிப்பெண் : 75

பிரிவு – அ

சரியான விடையைத் தேர்ந்தெடுத்து எழுதுக.   10 x
1 = 10

பிரிவு – ஆ

இரண்டு பக்க அளவில் விடையளிக்க .   5 x 5
= 25

     செய்யுள்   – 3 வினாக்கள்
     சிறுகதை   – 1 வினா
     இலக்கணம்   – 1 வினா

பிரிவு – இ

கட்டுரை வடிவில் விடை எழுதுக.   5 x 8
= 40

     செய்யுள்   – 3 வினாக்கள்
     சிறுகதை   – 1 வினா
     இலக்கிய வரலாறு   – 1 வினா

குறிப்பு :

     அ பிரிவு வினாக்கள், ஐந்து அலகுகளிலிருந்தும் அமைதல்
வேண்டும்.

     ஆ, இ, பிரிவுகளுக்குரிய வினாக்கள், 'இது' அல்லது 'அது' என்ற
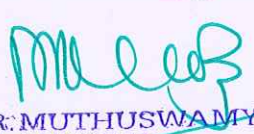வகையில்   அமைதல் வேண்டும்.

Program Educational Objectives

PEO – 1	Elevate the students of B.Sc. Computer Technology to be a successful technology professional in academic, industry, research, public sector and entrepreneurial quest
PEO – 2	Train the graduates to devise and grow several kinds of technologies by enriching strong application knowledge to meet the recent trends of IT and ITES sectors
PEO – 3	Instruct strong communication skills, team building skills and lifelong learning to meet their career goals
PEO – 4	Organize students by taking in value education that will put in to society with educational, moral and ethics

Program Outcomes

PO – 1	Understand proficient, ethical, and social issues and community responsibilities
PO – 2	Capability to intend, execute and assess a computer based system on par with the industry standards through the ability to identify the problem and capability to provide a solution
PO – 3	Correlate the knowledge of mathematics and computing in the field of project development and apply the obtained knowledge in real – time platform using latest tools and technologies
PO – 4	Improve the ability to communicate effectively and to work as individual or team in the industry / enterprise / community
PO – 5	Ability to excel in the field of IT and ITES by enduring learning to accomplish their goals

BoS Chairman/HoD
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