NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

(AUTONOMOUS)

DEPARTMENT OF COMPUTER TECHNOLOGY

UNDER CBCS PATTERN GUIDED BY UNIVERSITY AND TANSCHE

(FOR THOSE WHO ADMITTED FROM THE ACADEMIC YEAR 2016-2019 BATCH AND ONWARDS)

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER I								
I	16 UTL 101	TAMIL - I	6	3	25	75	100	3
	16 UHN 101	HINDI - I						
II	16 UEN 101	ENGLISH - I	5	3	25	75	100	3
III	16 UCT 101	CORE I: C PROGRAMMING	4	3	25	75	100	3
	16 UCT 102	CORE II: DIGITAL COMPUTER FUNDAMENTALS	4	3	25	75	100	4
	16 UCT 1A1	ALLIED I: MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE	5	3	25	75	100	4
	16 UCT 103	PROGRAMMING LAB - I ('C')	4	3	20	30	50	2
IV	16 UHR 101	HUMAN RIGHTS	1	2	-	50	50	2
	16 HEC 101	HUMAN EXCELLENCE-PERSONAL VALUES & SKY YOGA PRACTICE-I	1	2	25	25	50	1
V	16 UNS 401/ 16 UNC 402/ 16 USG 403	EXTENSION ACTIVITIES (NSS/NCC/SPORTS AND GAMES)	-					
TOTAL			30	-	170	480	650	22
SEMESTER II								
I	16 UTL 202	TAMIL - II	6	3	25	75	100	3
	16 UHN 202	HINDI - II						
II	16 UEN 202	ENGLISH - II	5	3	25	75	100	3
III	16 UCT 204	CORE III: OBJECT ORIENTED PROGRAMMING WITH 'C++'	4	3	25	75	100	3
	16 UCT 205	CORE IV: DATA STRUCTURES AND ALGORITHMS	4	3	25	75	100	4
	16 UCT 2A2	ALLIED II: DISCRETE MATHEMATICS	4	3	25	75	100	4
	16 UCT 206	PROGRAMMING LAB - II (C++)	4	3	20	30	50	2
IV	16 EVS 201	ENVIRONMENTAL STUDIES	2	2	-	50	50	2
	16 HEC 202	HUMAN EXCELLENCE - FAMILY VALUES & SKY YOGA PRACTICE - II	1	2	25	25	50	1
V	16 UNS 401/ 16 UNC 402/ 16 USG 403	EXTENSION ACTIVITIES (NSS/NCC/SPORTS AND GAMES)	-					
TOTAL			30	-	170	480	650	22

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER III								
III	16 UCT 307	CORE V: JAVA PROGRAMMING	5	3	25	75	100	4
	16 UCT 308	CORE VI: WEB DESIGNING (HTML, DHTML, XML, JavaScript)	5	3	25	75	100	4
	16 UCT 309	CORE VII: OPERATING SYSTEMS	5	3	25	75	100	5
	16 UCT 3A3	ALLIED III: COMPUTER SYSTEM ARCHITECTURE	5	3	25	75	100	4
	16 UCT 310	PROGRAMMING LAB - III (JAVA)	4	3	20	30	50	2
	16 UC T311	PROGRAMMING LAB - IV (WEB DESIGNING)	4	3	20	30	50	2
IV	16 HEC 303	HUMAN EXCELLENCE - PROFESSIONAL VALUES & SKY YOGA PRACTICE - III	1	2	25	25	50	1
	16 UCT 3N1/ 16 UCT3N2	SKILL BASED NON- MAJOR ELECTIVE I	1	2	-	50	50	2
V	16 UNS 401/ 16 UNC 402/ 16 USG 403	EXTENSION ACTIVITIES (NSS/NCC/SPORTS AND GAMES)	-					
TOTAL			30	-	165	435	600	24
SEMESTER IV								
III	16 UCT 412	CORE VIII: OPENSOURCE TECHNOLOGIES (PHP and MySQL)	5	3	25	75	100	4
	16 UCT 413	CORE IX: RELATIONAL DATABASE MANAGEMENT SYSTEM	5	3	25	75	100	4
	16 UCT 414	CORE X: DATA COMMUNICATION AND NETWORKS	5	3	25	75	100	4
	16 UCT 4A4	ALLIED IV: MICROPROCESSOR AND ALP	5	3	25	75	100	4
	16 UCT 415	PROGRAMMING LAB - V (OPENSOURCE TECHNOLOGIES)	4	3	20	30	50	2
	16 UCT 416	PROGRAMMING LAB - VI (RELATIONAL DATABASE MANAGEMENT SYSTEM)	4	3	20	30	50	2
IV	16 HEC 404	HUMAN EXCELLENCE - SOCIAL VALUES & SKY YOGA PRACTICE - IV	1	2	25	25	50	1
	16 UCT 4N3/ 16 UCT4N4	SKILL BASED NON-MAJOR ELECTIVE II	1	2	-	50	50	2
V	16 UNS 401/ 16 UNC 402/ 16 USG 403	NSS/NCC/SPORTS AND GAMES	-	-	-	50	50	1
TOTAL			30	-	165	485	650	24

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER V								
III	16 UCT 517	CORE XI: VB .NET PROGRAMMING	5	3	25	75	100	3
	16 UCT 518	CORE XII: COMPUTER GRAPHICS	5	3	25	75	100	3
	16 UCT 519	CORE XIII: SOFTWARE ENGINEERING	5	3	25	75	100	5
	16 UCT 520	ELECTIVE I	5	3	25	75	100	5
	16 UCT 521	PROGRAMMING LAB -VII (VB .NET PROGRAMMING)	4	3	40	60	100	2
	16 UCT 522	PROGRAMMING LAB - VIII (GRAPHICS and MULTIMEDIA)	4	3	40	60	100	2
IV	16 HEC 505	HUMAN EXCELLENCE - NATIONAL VALUES & SKY YOGA PRACTICE - V	1	2	25	25	50	1
	16 GKL 501	GENERAL KNOWLEDGE AND GENERAL AWARENESS	SS	2	-	50	50	2
	16 UCT 5S1/ 16 UCT 5S2	SKILL BASED MAJOR ELECTIVE I	1	2	-	50	50	2
TOTAL			30	-	205	545	750	25
SEMESTER VI								
III	16 UCT 623	CORE XIV: J2EE TECHNOLOGIES	6	3	25	75	100	4
	16 UCT 624	ELECTIVE-II	6	3	25	75	100	5
	16 UCT 625	ELECTIVE-III	6	3	25	75	100	5
	16 UCT 626	PROGRAMMING LAB - IX:(J2EE TECHNOLOGIES)	5	3	40	60	100	2
	16 UCT 627	INDUSTRY ORIENTED PRACTICALS	5	3	40	60	100	4
IV	16 HEC 606	HUMAN EXCELLENCE - GLOBAL VALUES & SKY YOGA PRACTICE - VI	1	2	25	25	50	1
	16 UCT 6S3/ 16 UCT 6S4	SKILL BASED MAJOR ELECTIVE II	1	2	-	50	50	2
TOTAL			30	-	180	420	600	23
TOTAL			180	-	1055	2845	3900	140

LIST OF MAJOR ELECTIVE PAPERS

ELECTIVE -I	**A. Cloud Computing**
	B. Distributed Computing
	C. Digital Image Processing
ELECTIVE -II	**A. Embedded Systems**
	B. Animation Techniques
	C.Computer Installation and Servicing
ELECTIVE -III	**A. Cyber Security**
	B. Mobile Computing
	C. Data Mining

LIST OF SKILL-BASED ELECTIVE PAPERS

ELECTIVE -I (NON-MAJOR)	**A. HTML Lab**
	B. Multimedia Lab
ELECTIVE -II (NON-MAJOR)	**A. Office Automation Lab**
	B. Coreldraw Lab
ELECTIVE -I (MAJOR)	**A. HTML5 with CSS**
	B. Visual Basic
ELECTIVE -II (MAJOR)	**A. Data Analytics (Big Data)**
	B. DreamWeaver

Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2016-17
Subject Code & Title	16UCT101 & C PROGRAMMING	**Semester:** I
Hrs/Week:	4 Hrs	**Credit:** 3
Objectives	To develop programming skills using C language.	
Unit	**Content**	**Hrs**
Unit I	**Introduction:** Need of Languages – Categories of Languages – Why C Language – History of C Language - Structure of a C Program. What is C character set – Identifier – Rules for Identifier or word – Variable – Constant - Data types – Declaration of a variable – Expressions – Operators – Evaluation of an Expression and precedence of operators – Size of() Operator – Typecasting. **Statements:** Input and Output Statements – Escape sequence Characters - Unformatted I/O Statements – Library Functions.	10
Unit II	**Control Statements:** Unconditional Control statements – Conditional Control statements – Looping Statements – break statement – continue Statement. **Arrays**: Introduction - Declaration – Refer the values of the Array Variable – Assigning Data for Array – Multi-Dimensional Array – Two-Dimensional Array – How to process Elements in Two – Dimensional Array – Array Index Out of Bounds.	10
Unit III	**Strings:** Introduction – Assigning Values – Reading a string – Library Functions. **Functions**: Introduction –Parameter / Argument? – return statement – Types of Functions – Calling with Expression – Passing Array to the Function – Recursive Function.	10
Unit IV	**Pointers:** Introduction –Pointer – Operators in Pointer – Declaration – Pointer and Expressions – Pointers and Arrays – Pointers and Strings – Pointers and Functions – Call by Value – Call by Reference – Passing Array to the Function – Passing String to the Function – Array of Pointers – Calling functions using pointers. **Structure and Unions:** Structure –	11

	Declaration – Referring Data in Structure – Assigning values – Array of Structures – Structure and pointer – Structure and Functions. **Union:** Difference between structure and union - typedef – Enumerated data type.	
Unit V	**Files:** Introduction – Declaring File Type Variable – Open/Close operations of File – Reading / Writing character in a File – Check end of File – Read/Write –Line of Characters – Read / Write Record in the File – Random File Operations – fseek(), ftell(), rewind(). **Preprocessor:** Introduction - #define, #include – Command Line Arguments.	11

Text Book:

1. Karthikeyan. E, (2008), "A Text Book on C – Fundamentals, Data Structures and Problem Solving", Prentice-Hall, ISBN: 978-81-203-3424-3.

Reference Books:

1. Ashok N Kamthane, (2004), "Programming and Data Structures" – Pearson Education, First Indian Print, ISBN: 81-297-0327-0.
2. Yashavant Kanetkar, (2012), "Let Us C", 13th Edition, BPB Publications, ISBN-13: 9788183331630.
3. Pradip Dey, Manas Ghosh, (2008), "Computer Fundamentals and Programming in C", Oxford Publications.
4. https://www.syncfusion.com/resources/techportal/ebooks/objective-c

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2016-17
Subject Code & Title	16UCT102 & DIGITAL COMPUTER FUNDAMENTALS	**Semester:** I
Hrs/Week:	4 Hrs	**Credit:** 4
Objectives	To convey the knowledge on digital circuits, Logic Gates and about interfacing of various components.	

Unit	**Content**	**Hrs**
Unit I	**Number Systems and Binary Codes:** Digital Electronics – Integrated circuits or Chip - Decimal System - Binary system – Octal System – Hexadecimal System – Binary addition – Binary Multiplication and Division – Double precision Numbers - Floating Point Representation – 1's Complement of a binary Number - BCD – Excess-3 Code – Gray Code – Alphanumeric codes – Weighted Codes – Parity method for error detection and correction.	10
Unit II	**Boolean Algebra-Logic Gates– Karnaugh Map and Minimization:** Boolean Algebra – Gates – Inverter or NOT Gate – OR Gate – AND Gate – NOR Gate – NAND Gate – De Morgan's Theorems – Exclusive OR Gate – Exclusive NOR Gate – Karnaugh Map – Canonical Form I – Karnaugh Map - Construction and Properties – Implicants – Don't Care Combinations – Irredundant expressions – Minimization of SOP form using Karnaugh map - Minimization of POS form using Karnaugh map.	11
Unit III	**Arithmetic and Logic circuits**: Arithmetic and Logic circuits – Half Adder – Full Adder – Parallel Binary Adders – BCD Adder – 2's Complement Adder – Half-Subractor – Full-Subtractor – Parallel Binary Subtractors – 2's Complement Subtractor – 2's Complement Adder/Subtractor – Binary Multiplier – Binary Divider – Comparator.	10

Unit IV	**Sequential Circuits, Flip-Flops**: Sequential circuits – Flip-Flops – R-S Flip-Flops – Clock Signals – Clocked R-S Flip-Flop – Data Latch or D-Flip-Flop – Clocked Data Latch – Positive Edge Triggered Data Flip-Flop - Positive Edge Triggered J-K Flip-Flop - T Flip-Flop – Master-Slave J K Flip-Flop. **Registers:** Registers – Shift registers – Shift-left Register - Shift-Right Register – Decoder – Encoder – Multiplexer – Demultiplexer.	11
Unit V	**Counters:** Counters – Ring Counter – Synchronous Up/Down Counter – Programmable Counter. **Semiconductor memories:** Memory Unit – Concept of Memory Using Registers – Read Only Memories – Random Access Memories – Programmable Array Logic(PAL) – Programmable Logic Arrays(PLA) – Buffer – Cache Memory.	10

Text Book:

1. Puri.V.K, (2011), "Digital Electronics Circuits and Systems", 22nd Reprint, TATA Mc-Graw Hill Publications, ISBN-10: 0- 07- 463317-1.

Reference Books:

1. Donald P Leach, Albert Paul Malvino, Gautam Saha, (1994), "Digital Principles and Applications", 6th Edition, TATA McGraw-Hill Publications.
2. Mandal S K, (2010), "Digital Electronics: Principles and Applications", 1st Edition, ISBN-13: 9780070153820.
3. https://books.google.co.in/books/about/Digital_Computer_Fundamentals.html?id=0zSPIRaL9RkC

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Department of Computer Technology
PROGRAMMING LAB - I ("C")
Semester I

Subject Code: 16UCT103 **Credit: 2**

Total Hrs: 52

Objective: On successful completion of this subject the students should have:

- developed the skills to write programs in C.

1. Write a C program to convert a number from decimal to binary.
2. Write a C program to check whether the given number is Armstrong or not.
3. Write a C program to find maximum or minimum in an array.
4. Write a C program to find npr and ncr values of a given number.
5. Write a C program to find the factorial of a given number.
6. Write a C program to generate Fibonacci series.
7. Write a C program to generate N prime numbers.
8. Write a C program to find whether the number is palindrome or not.
9. Write a C program to check whether the given year is leap year or not.
10. Write a C program to generate a Pascal triangle.
11. Write a C program to check whether a person is eligible for voting or not.
12. Write a C program to perform linear search in a given array.
13. Write a C program to display transpose matrix of a given number.
14. Write a C program for matrix multiplication.
15. Write a C program to determine whether it is a sparse matrix or not.
16. Write a C program to perform string concatenation.
17. Write a C program for sorting a string using user defined function.
18. Write a C program to convert uppercase to lower case and vice versa.
19. Write a C program to insert or delete an element in an array.
20. Write a C program to arrange the array of numbers in ascending or descending order.
21. Write a C program to find GCD of two numbers using recursion.
22. Write a C program for dynamic memory allocation.
23. Write a C program to merge two files.
24. Write a C program to read and write to the file using fread() and fwrite() functions.

25. Write a C program to create a file and store the information about a person.
26. Write a C program to count numbers of words, blank spaces, special symbols, vowels in a given text using pointers.
27. Write a C program to display a character along with its location in a file using ftell().

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Department	Computer Technology	
Course	B. Sc. C. T	**Effective From the Year:** 2016-17
Subject Code & Title	16UCT1A1 & MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE	**Semester:** I
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	To teach the concepts of Matrices, Algebraic Equations, Numerical Differentiation and Integration. To make the students to learn the applications of statistical and numerical methods for Computer Applications.	
Unit	**Content**	**Hrs**
Unit I	**Matrices** – Introduction – Determinants – Inverse of a matrix – Rank of a Matrix – Eigen value Problems.	13
Unit II	**System of Simultaneous Linear algebraic Equation:** Gauss elimination, Gauss Jordan, Gauss Seidel methods. **The solution of Numerical Algebraic and Transcendental equation** – Bisection method – Newton Raphson method – False position method.	13
Unit III	**Numerical Differentiation:** Newton's forward Difference - Backward Difference – **Startling formula Numerical Integration**: Trapezoidal Rule and Simpson's rule - **Numerical solution of ordinary differential equations:** Taylor method & Runge-kutta method.	13
Unit IV	**Measures of central tendency:** Mean (Individual Series), Median (Discrete Series) and Mode (Continuous Series) – Relationship among mean, median and mode. **Measures of dispersion:** Range, quartile deviation, mean deviation and Standard deviation.	13
Unit V	**Correlation**: Karl Pearson's coefficient of correlation – **Rank correlation regression:** Regression Equations – Difference between Correlation and Regression.	13

Text Books:

1. Dr. Venkataraman. M. K, “Engineering Mathematics” Volume II, Third Edition, NPC – (Unit I).
2. Kandasamy. P, Thilagavathi. K, Gunavathi. K, (2006), “Numerical Methods”, Revised Edition, New Delhi, S. Chand and Company Ltd, ISBN-13: 9788121914383. (Unit II & III).
3. Pillai.R.S.N, Bagavathi.V, (2005), “Statistical Methods”, New Delhi, Sultan Chand and Sons Company Limited, (Unit IV & V).

Reference Books:

1. BalaGurusamy .E, (1999), “Numerical methods”, First Edition, Tata MC-Graw Hill, ISBN-13: 9780074633113.
2. Gupta .S.C, Kapoor .V.K, **(**2007), “Fundamental of Mathematical Statistics”, Sultan Chand and Sons, ISBN-13:9788180540042.
3. https://www.scribd.com/doc/205496933/Mathematical-Structures-for-Computer-Science

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Department	Computer Technology	
Course	B. Sc (C.T)	**Effective From the Year:** 2016-17
Subject Code & Title	16UCT204 & OBJECT-ORIENTED PROGRAMMING WITH C++	**Semester:** II
Hrs/Week:	4 Hrs	**Credit:**3
Objectives	To develop the programming ability in C++ by knowing the OOPS concepts like Encapsulation, Abstraction, Inheritance, Polymorphism, Exception handling etc.	

Unit	Content	Hrs
Unit I	**Principles of Object-Oriented Programming**: Procedure-Oriented Programming – Object /Oriented Programming Paradigm – Basic Concepts of OOP – Benefits of OOP. **Beginning with C ++:** Structure of C ++ Program. **Tokens, Expressions and Control Structures:** Tokens – Keywords – Identifiers - Data types – Declaration of Variables – Dynamic Initialization of Variables – Reference Variables – Operators – Scope Resolution Operator – Expressions - Operator Precedence – Control Structures.	11
Unit II	**Functions in C++:** The Main () Function – Function Prototype – Call by Reference – Return by Reference - Inline Functions – Default Arguments – Function Overloading – Friend and Virtual Functions. **Classes and Objects:** Specifying Class – Defining Member Functions – Private Member Functions – Array with a Class – Static Data Members – Static Member Functions – Array of Objects – Objects as Function Arguments – Returning Objects – Const Member Functions.	11
Unit III	**Constructors and Destructors:** Constructors – Parameterized Constructors – Multiple Constructors in a class – Copy Constructors - Dynamic Constructors – Destructors. **Operator Overloading and Type Conversion:** Defining Operator Overloading Function – Overloading Unary Operators – Overloading Binary Operators – Overloading Operators with Friend Functions – Rules for Overloading Operators.	10

Unit IV	**Inheritance:** Defining Derived Classes – Types of Inheritance – Virtual Base Classes – Abstract Classes – Nesting of Classes. **Pointers, Virtual Functions and Polymorphism:** Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Function - Pure Virtual Functions.	10
Unit V	**Managing Console I/O Operators:** C++ Streams – Stream Classes – Unformatted I/O Operator – Formatted Console I/O Operations. **Working with Files:** Classes for File Stream Operations – Opening and Closing a File – Detecting end–of-File - File Open Modes – File Pointers and Their Manipulators.	10

Text Book:

1. BalaGurusamy .E, (1998), "Object Oriented Programming with C++", TMH Publication, ISBN-13: 9781259062216.

Reference Books:

1. Ashok N Kamthane, (2003), "Object-Oriented Programming with ANSI and Turbo C++", Pearson Education publication, ISBN-13:9788131703830.
2. Maria Litvin and Gary Litvin, (2002), "C++ for you", Vikas Publication, ISBN-13: 9788125912026.
3. John R Hubbard, (2002), "Programming with C++", 2nd Edition, TMH Publication, ISBN-13: 9780071353465.
4. Bhushan Trivedi, (2007) "Programming with Ansi C++", Oxford University Press, ISBN-13: 9780198063087.
5. https://www.syncfusion.com/resources/techportal/ebooks/cplusplus

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Course	B. Sc. C. T	**Effective From the Year:** 2016-17
Subject Code & Title	16UCT205 & DATA STRUCTURES AND ALGORITHMS	**Semester:** II
Hrs/Week:	4 Hrs	**Credit:** 4
Objectives	To teach about the concepts of Array, Stack, Queue, List, Linked List, Tree, and Searching.	

Unit	Content	Hrs
Unit I	**Introduction** - Definition – Structure and properties of Algorithms – Development of an Algorithm – Data structures and Algorithms – Data structure – Definition and Classification. **Arrays:** Introduction – Array Operations - Number of elements in an array, representation of Arrays in Memory, Applications.	10
Unit II	**Stacks:** Introduction – Stack Operations – Applications .**Queues:** Circular Queues – Other types of Queues – Applications.	10
Unit III	**Linked Lists:** Introduction – Singly Linked Lists – Circular Linked Lists – Doubly Linked Lists – Applications.	10
Unit IV	**Trees:** Introduction – Trees – Basic Terminologies - Representation of Trees. **Binary Trees:** Basic Terminologies and Types - Representation of Binary Trees - Binary Tree Traversals – Threaded Binary Trees – Applications. **Graphs:** Introduction – Definition and basic Terminologies.	11
Unit V	**File Organizations:** Introduction – Files - Keys – Basic File Operations – Sequential File Organizations – Indexed sequential File Organizations – Direct File Organizations. **Searching:** Linear search – Binary search. **Sorting:** Merge sort and Quick sort.	11

Text Book:

1. GAV Pai, (2011), "Data Structures and Algorithms – Concepts, Techniques and Applications", Tata MCGrawHill Publications, ISBN-13: 978-0-07-066726-6.

Reference Books:

1. Aaron M Tanenbaum, Yedidyeh langsam, Moshe J Augenstein,(2009) "Data Structure using C", Facsimile Edition, PHI Publication, ISBN-13: 9780131997462.
2. Ellis Horowitz and Sartaj Sahni, (1999), "Fundamentals of Data Structure", 2nd Edition, Galgotia Book Source, ISBN-13: 9780716782636.
3. Ashok N Kamthane, (2004), "Programming and Data Structures", Pearson Education, 1st Indian Print, ISBN: 81-297-0327-0.
4. https://www.syncfusion.com/resources/ebooks/datastructurespart1
5. https://www.syncfusion.com/resources/ebooks/datastructurespart2

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Department of Computer Technology

PROGRAMMING LAB - II (C++)

Subject Code: 16UCT206 **Credit: 2**

Semester II **Total Hrs: 52**

1. Write a C++ program to check given two strings are equal or not using user defined function.
2. Write a C++ program to swap two numbers by function through pass by value, address and reference.
3. Write a C++ program to calculate the area of regular hexagon using user-defined function with arguments and return value.
4. Write a C++ program to find largest of two numbers using inline function.
5. Write a C++ program to find volume of cube, cylinder and rectangle using function overloading.
6. Write a C++ program to find LCM of two numbers using recursive function.
7. Write a C++ program to display numbers in Floyd triangle format using class.
8. Write a C++ program to find sum of individual digits of natural numbers using class.
9. Write a C++ program to solve the second order quadratic equation using class.
10. Write a C++ program to find mean of two numbers using friend function.
11. Write a C++ program to check prime number or not using constructor, destructor and copy constructor.
12. Write a C++ program for stack operation.
13. Write a C++ program for queue operation.
14. Write a C++ program for single linked list operation.
15. Write a C++ program for merging and sorting of two arrays.
16. Write a C++ program to overload ++ unary operator.
17. Write a C++ program to concatenate two strings by overloading binary operator ++ using member function.
18. Write a C++ program to overload binary operator '+' and '-'using friend function.
19. Write a C++ program to process employee pay slip processing using single inheritance.
20. Write a C++ program to process student details using multiple inheritance.

21. Write a C++ program for hybrid inheritance.
22. Write a C++ program using “virtual” keyword.
23. Write a C++ program for conversion of one class to another class.
24. write a C++ program to display successor and predecessor of a given number using concept of pointer to derived and base class.
25. Write a C++ program to illustrate the concept of new and delete operators.
26. Write a C++ program to perform file operations using read() and write() functions.
27. Write a C++ program to convert uppercase to lowercase and vice versa in a file.
28. Write a C++ program to copy from one file to another file using command line arguments.
29. Write a C++ program to merge two files into one file
30. Write a C++ program for class template.
31. Write a C++ program for function template.

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Department	Computer Technology	
Course	B.Sc (C.T)	**Effective From the Year:** 2016-17
Subject Code & Title	16UCT2A2 & DISCRETE MATHEMATICS	**Semester:** II
Hrs/Week:	4 Hrs	**Credit:** 4
Objectives	To instruct the concepts of Set Theory, Relations, Languages and Graph Theory.	
Unit	**Content**	**Hrs**
Unit I	Set theory-Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams- Set operations & Laws of set theory-Fundamental products-partitions of sets - minsets- Algebra of sets and Duality-Inclusion and Exclusion principle.	10
Unit II	Mathematical logic – Introduction - Prepositional calculus – Basic logical operations - Tautologies - Contradiction - Argument - Method of proof.	10
Unit III	Relations – Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations – Functions – Types of functions – Invertible functions – Composition of functions.	10
Unit IV	Languages – Operations on languages – Regular Expressions and regular languages – Grammar – Types of grammars – Finite state machine – Finite – State automata.	11
Unit V	Graph Theory – Basic terminology – Paths, Cycle and Connectivity – Sub graphs – Types of graphs – Representation of graphs in computer memory.	11

Text Book:

1. Sharma J. K, (2005) "Discrete Mathematics", 3rd Edition, MacMillan India Ltd, ISBN-13: 9780230322301.

Reference Books:

1. Tremblay J.P, Manohar R, (2002), "Discrete Mathematics Structures with Applications to Computer Science", TATA McGraw-Hill Publications.
2. Dr. Venkataramen .M.K, Dr Sridharan .N, Chandarasekaran .N, (2000) "Discrete Mathematics" The National publishing Company Chennai. ISBN-13: 9788172863722.
3. http://pdfebooklibrary.com/ebooks/discrete-mathematics-book-download.pdf

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Department	Computer Technology	
Course	B.Sc. (C. T)	**Effective From the Year:** 2017-18
Subject Code & Title	16UCT307 & JAVA PROGRAMMING	**Semester:** III
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	Ability to write Programs in Java using the Oops Concepts like Encapsulation, Data Abstraction, Inheritance, Polymorphism and Exception handling and to develop Applets.	

Unit	Content	Hrs
Unit I	**Java Evolution** – History, Features, How Java differs from C and C++, Java support systems, Java environment – Overview of Java Language – Constants, Variables and Data Types - Operators and Expressions – Decision Making and Branching.	13
Unit II	**Classes, Objects and Methods** – Arrays, Strings and Vectors – **Interfaces:** Multiple Inheritances – **Packages:** Putting Classes Together.	13
Unit III	**Multithreaded Programming:** Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the Runnable Interface. **Managing Errors and Exceptions**: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statements – Throwing our Own Exceptions – Using Exceptions for Debugging.	13
Unit IV	**Applet Programming:** How Applets Differ From Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet –Applet Tag – Adding Applet to HTML File – Running the Applet – More About Applet Tag – Passing Parameters to Applets – Aligning the Display– Displaying Numerical Values – Getting Input From the User. **Graphics Programming –**The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Chart.	13

Unit V	**Managing Input / Output Files in Java:** Concept of Streams – Stream Classes – Byte Stream Classes – Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the File Class – Input / output Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – Concatenating and Buffering Files – Random Access Files – Interactive Input and Output – Other Stream Classes.	13

Text Book:

1. Balagurusamy. E, (2011), "Programming With JAVA A Primer", 2nd Edition, Tata McGraw Hill Publications, ISBN-13: 9780070141698.

Reference Books:

1. John R. Hubbard, (2007), "Programming with Java", 2nd Edition, Schaum's Outline Series, Tata McGraw Hill Publications, ISBN-13: 9780070589421.
2. Timothy Budd, (2007), "Understanding Object Oriented Programming with Java", Pearson Education, ISBN-13: 9780201308815.
3. Deitel & Deitel, (2008), "Java TM: How to Program", 7th Edition, PHI, ISBN-13: 9780136123712.
4. iiti.ac.in/people/~tanimad/JavaTheCompleteReference.pdf
5. http://www.onlineprogrammingbooks.com/learning-java-4th-edition/

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Department	Computer Technology	
Course	B.Sc. (C.T)	**Effective From the Year:** 2017-18
Subject Code & Title	16UCT308 & WEB DESIGNING (HTML, DHTML, XML and JAVASCRIPT)	**Semester:** III
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	To convey the knowledge about the Internet, Web Browsers, Web Page Creation using Scripting Languages.	
Unit	**Content**	**Hrs**
Unit I	**HTML and Graphics:** Document Structure Tags – Formatting Tags – List Tags – Hyper Link Tags – Image and Image maps **Image Maps:** Client-Side Image Maps – Server-side Image Maps – Using Server-side and Client-Side Image maps together. **Tables:** Introduction – The Table Tags – Alignment – Controlling Other Table Attributes – Spanning Multiple Rows and Columns – Table Section and Column Properties.	13
Unit II	**Frames:** Introduction – Setting up a Frames Document – Placing Content in Frames with the <FRAME> Tag – Creating Floating Frames – Using Hidden Frames. **Forms:** Creating Forms – Labeling Input Fields –Form Field Event Handlers – Passing Form Data. **Style Sheets:** Linking to Style Information in a Separate File – Embedded Style Information – Inline Style Information – Tips for Style Users.	13
Unit III	**Introduction to Java Scripting –** Introduction – The Java Script Language – Programming with Java Script –Java Script and Web Browsers. The Web Browser Object Model: The Window – Location– History – Document – Link, Area and Anchor – Form – Image – Java Script Objects.	13
Unit IV	**Introduction to DHTML:** Web Page Layout and Content Positioning – Dynamic Styles with Cascading Style Sheets – Dynamic Fonts. **Advanced Microsoft Dynamic HTML:** Microsoft's Implementation of DHTML – Internet Explorer Document Object Model – Dynamic HTML Events and the Event	13

	Object – Using Dynamic HTML and the Data Source Object – Position HTML Elements with Dynamic HTML – DHTML Filters – Microsoft Script lets.	
Unit V	**XML Overview –** Linking with XML - Using Style sheets with XML - **Anatomy of an XML Document:** XML Markup – A Sample XML Documents – Logical Structure – Physical Structure – Markup Declarations – Element Markup – Attribute Markup – Naming Rules – Comments. **Creating XML Documents**: Markup Declarations – Element Declarations – Element Content Models – Attribute Declarations. **Creating XML Document Type Definitions:** DTDs Validation-Document Type Declarations-Standalone XML Documents-Developing the DTD from XML.	13

Text Book:

1. Erric Ladd, Jim O'Donnell, (1999), "Using Html 4, Xml, Java 1.2", Platinum Edition, 1st Edition, ISBN-13: 9788120315396.

Reference Books:

1. Atul Kahate, (2007), "Web Technologies", Tata McGraw Hill, Sixth Reprint, ISBN-13: 9789332900912.
2. Goldberg, (2007), "XML", 2nd Edition, Pearson India, ISBN-13 9788131734742.
3. Thomas A. Powell, (2010), "Html & CSS: The Complete Reference, 5th Edition, McGraw Hill Education, ISBN-13 9780070701946.
4. http://freecomputerbooks.com/webHtmlBooks.html

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year**: 2017-18
Subject Code & Title	16UCT309 & OPERATING SYSTEMS	**Semester:** III
Hrs/Week:	5 Hrs	**Credits:** 5
Objectives	On Successful Completion of this subject the students should have known about: - OS Concepts, Process, Files, Dead Lock Etc.,	
Unit	**Content**	**Hrs**
Unit I	**Operating-System Structures**: System Components- Operating System Services – System Calls – System Programs – System Structure.	13
Unit II	**Process Management**: Process Concept – Process scheduling – Operations on Process – Cooperating Processes – Inter-process Communication **CPU Scheduling** : Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling – **Process Synchronization:** The Critical-Section Problem – Semaphores – Classic problems of Synchronization.	13
Unit III	**Deadlocks**: Deadlock Characterization – Methods for handling Deadlock – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlock – **Memory Management**: Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation.	13
Unit IV	**Storage Management:** Virtual memory – Demand Paging –Page Replacement: FIFO Page Replacement – Optimal Page Replacement – LRU Page Replacement – File concept – Access methods – Directory Structure .	13
Unit V	File System Structure – Allocation methods - Disk Structure – Disk Scheduling – Disk management – **Case study:** Linux, Windows XP.	13

Text Book:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2011), "Operating System Concepts" 6th Edition, John Wiley and Sons, ISBN-13 9789812530554.

Reference Books:

1. Achyut.S Godbole(2002), "Operating Systems", 1st Edition, TMH Publications, ISBN-139780070483736.
2. H. M Deitel (2003), "Operating Systems", 2nd Edition, Pearson Education Publication.
3. D.M. Dhamdhere (2008), "Systems Programming and Operating Systems ", 2nd Revised Edition.
4. http://www.faadooengineers.com/threads/9773-Operating-system-by-galvin-pdf-Free-Download
5. http://nptel.ac.in/courses/106108101/13

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB III (JAVA)

Semester III

Subject Code: 16UCT310 **Credits: 2**

Total Hrs: 52

1. Write a java program to perform Arithmetic operations using Switch Case.

2. Write a java program to calculate the factorial of a given number.

3. Write a java program to check whether the given string is a palindrome or not.

4. Write a java program to get student information and display it using array.

5. Write a java program for subclass using polymorphism, inheritance, method overriding and constructor.

6. Write a java program to merge and sort the given number of two arrays.

7. Write a java program to perform the addition of two matrices.

8. Write a java program to perform the comparison of two strings.

9. Write a java program to calculate tax from the given current tax rate using the concept of Interface.

10. Write a java program to perform the usage of vector class.

11. Write a java program to illustrate the concept of Package creation.

12. Write a java program to illustrate the concept of multithreading using sleep() and stop() functions.

13. Write a java program to illustrate the concept of synchronization.

14. Write a java program to illustrate the concept of Exception Handling Mechanism.

15. Write a java program to develop an applet window for mouse Event.

16. Write a java program to calculate the sum of two numbers.

17. Write a java program to find the largest of three numbers.

18. Write a java program to develop an applet for calculator.

19. Write a java program to draw a face in Applet Programming.

20. Write a java applet program to illustrate the movement of a car.

21. Write a java program to illustrate the concept of swing.

22. Write a java program to create a new file and rename it.

23. Write a java program to illustrate the concept of copying bytes from one file to another.

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB – IV (WEB DESIGNING)

Semester – III

Subject code: 16UCT311 **Credit: 2**

Total Hrs: 52

1. Prepare a webpage for our college using basic HTML tags.
2. Prepare a College Alumni Cell webpage.
3. Prepare a Departmental store details using OL & UL.
4. Prepare Frames which includes 4 html programs.
5. Prepare an Industrial Visit agenda for Two days.
6. Prepare a webpage for seven wonders.
7. Prepare an Advertisement for any one high sale product.
8. Prepare a Bio-data form using DHTML.
9. Prepare an E-Mail creation form using DHTML.
10. Prepare your Proctorial form details using DHTML.
11. Create a home page using xml.
12. Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Declaration
13. Usage of Internal DTD, External DTD, Entity Declaration.
14. Design a catalog using XML.
15. Create a java script code block using arrays to generate the current data in words.
16. Create a web page which accepts user information and user commands on the web site to Check if all the text fields have been entered with data else display an alert.
17. Create a web page using two image files, which switch between one another as the mouse Pointer moves over the images.

18. Using Java Script's Window and document objects and their properties and various
19. Methods like alert (), evaI (), Parselnt () etc. methods to give the dynamic functionality to HTML web pages
20. Writing Java Script snippet which make use of Java Script's inbuilt as well as user.

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year**: 2017-18
Subject Code & Title	16UCT3A3 & COMPUTER SYSTEM ARCHITECTURE	**Semester:** III
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	To teach about elements of Computer Organization and Architectures and hardware operations of computers.	
Unit	**Content**	**Hrs**
Unit I	**Basic Computer Organizations and Design:** Instruction Codes – Computer Registers – Computer Instructions –Timing Control – Instruction Cycle – Memory-Reference Instructions –Input-Output and Interrupt.	13
Unit II	**Central Processing Unit:** General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control – Reduced Instruction Set Computer(RISC).	13
Unit III	**Computer Arithmetic:** Addition and Subtraction – Multiplication Algorithms – Division Algorithms – Floating-Point Arithmetic Operations: Register Configuration – Addition and Subtraction.	13
Unit IV	**Input-Output Organization:** Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access(DMA) – Input-Output Processor(IOP).	13
Unit V	**Memory Organization:** Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware.	13

Text Book:

1. Morris Mano. M, (1992), "Computer System Architecture", 3rd Edition, Pearson Education, ISBN: 978-81-317-0070-9.

Reference Books:

1. John I Hennessy, "Computer Architecture", 4th Edition, ISBN: 97831207260.
2. Saini S.P.S, (2010), "Computer System Architecture and Organization", S.K. Kataria & Sons Publication, ISBN-13: 9788189757731.
3. Hamacher.C, Zvonko.V, Zaky.S, (2011), "Computer Organization", 5th Edition Tata McGraw Hill Publication, ISBN-13: 9781259005275.
4. https://imlearner.files.wordpress.com/2010/08/computer-system-architecture-3rd-ed-morris-mano-p98.pdf

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based NON-MAJOR ELECTIVE I - HTML LAB

Semester III

Credit: 2

Subject Code: 16UCT3N1 **Total Hours: 13**

Objective: On Successful Completion of this subject the students should have:

- The ability to develop documents and web pages using HTML.

1. Create a HTML document using basic HTML tags.
2. Create a HTML program with text formatting tags.
3. Create a HTML program to set the background color.
4. Create a link by using HTML tags.
5. Create a HTML program to insert an image in a document.
6. Create a HTML program to create a table.
7. Create a HTML program to implement ordered list with numbers.
8. Create a HTML program to implement ordered list with alphabets.
9. Create a HTML program to implement unordered list (circle and square).
10. Create a Form with input box and submit button.
11. Create a Form with radio button input.
12. Create a simple webpage.

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based NON-MAJOR ELECTIVE I - MULTIMEDIA LAB

Semester III

Credit: 2

Subject Code: 16UCT3N2 **Total Hours: 13**

Objective: On Successful Completion of this subject the students should have:

- The ability to work in Multimedia software (Photoshop).

1. Convert Black and White Photo to Color Photo using Photoshop.
2. Create an animation to represent the growing Moon.
3. Create an animation to indicate a Ball bouncing on Steps.
4. Remove background noise from a photograph.
5. Create an animated cursor.
6. Fill text in with an image.
7. Create a drop shadow and scale its effects on a layer.
8. Adjust the perspective of an image using the Crop tool.
9. Create a mask based on color and change that color.
10. Create a Web Page using Photoshop.

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2017-18
Subject Code & Title	16UCT412 & OPENSOURCE TECHNOLOGIES (PHP and MySQL)	**Semester:** IV
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	To teach the concepts of Variables and Data Types, Arrays and various MySQL Queries and Connectivity.	
Unit	**Content**	**Hrs**
Unit I	**Introducing PHP:** History – Unique features – Basic Development Concepts – Creating your First PHP Script – Sample Applications. **Using Variables and Operators:** Storing Data in Variables – Understanding PHP's Data types – Setting and Checking Variable Data Types – Using Constants – Manipulating Variables with Operators – Handling Form Input.	13
Unit II	**Controlling Program Flow:** Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Actions with Loops – Working with String and Numeric Functions. **Working with Arrays:** Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms – Working with Array Functions – Working with Dates and Times.	13
Unit III	**Using Functions and Classes:** Creating User-Defined Functions – Creating Classes – Using Advanced OOP Concepts. **Working with Files and Directories:** Reading Files – Writing Files – Processing Directories – Performing Other File and Directory Operations.	13
Unit IV	**Working with Databases and SQL:** Introducing Databases and SQL – Creating and Populating a Database – Using PHP's MySQLi Extension – Adding or Modifying Data – Handling Errors. Using PHP's SQLite Extension – Using PHP's PDO Extension – Using a MySQL Database – Switching to a different Database.	13

Unit V	**Working with Cookies, Sessions and Headers:** Working with Cookies – Saving and Restoring User Preferences – Working with Sessions – Using HTTP Headers. **Handling Errors:** Handling Script Errors – Using Exceptions – Validating form Input – Logging Errors –Debugging Errors.	13

Text Book:

1. Vikram Vaswani, (2009), "PHP: A Beginner's Guide", Second Reprint, Tata McGraw Hill Publications, ISBN-13: 9780070140691.

Reference Books:

1. Tim Converse, (2000), "PHP 4 Bible", IDG Books Worldwide, INC, An International Data Group Company, ISBN-13: 9788126501472.
2. Rasmus Lerdorf, Kevin Tatroe, (2011), "Programming PHP", 2nd Edition, O'Reilly Media, 1st Edition, ISBN-13: 9788184042719.
3. Luke Welling; Laura Thomson, (2010), "PHP and MySQL-Web Development", 4th Edition, ISBN-13: 9788131729878.
4. http://cdn.phpreferencebook.com/wp-content/uploads/2008/12/php_reference_-_beginner_to_intermediate_php5.pdf

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2017-18
Subject Code & Title	16UCT413 & RELATIONAL DATABASE MANAGEMENT SYSTEM	**Semester:** IV
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	This subject is intended to introduce the fundamental concepts necessary for designing, using and implementing Database systems and applications.	
Unit	**Content**	**Hrs**
Unit I	**Database Concepts – A Relational approach:** Database – Relationships – DBMS – The Relational Data Model – Integrity Rules – Theoretical Relational Languages. **Database Design – Data Modeling and Normalization:** Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams –Denormalization – Another Example of Normalization.	13
Unit II	**Oracle9i – An Overview:** Personal Database – Client/Server Databases - Oracle9i: An Introduction – The SQL *Plus Environment – SQL – Logging into SQL *Plus – SQL *Plus Commands – Oracle Errors and Online Help – Alternate Text Editors - SQL *Plus Worksheet – *i*SQL *Plus. **Oracle Tables – Data Definition Language**: Naming Rules and Conventions – Data Types – Constraints – Create, Display, Alter, Drop, Rename and Truncating Oracle Table – Table Types – Spooling – Error codes.	13
Unit III	**Working with Tables - Data Management and Retrieval:** DML – Adding a New Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – Retrieving Data from a Table – Arithmetic Operations – Restricting Data with a WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE Command – CASE structure. **Functions and Grouping**: Built-In functions – Grouping Data.	13

Unit IV	**Multiple Tables: Joins and Set operators**: Join – Set Operators. **PL/SQL – A Programming Language:** History – Fundamentals of PL/SQL – PL/SQL Block Structure – Comments – Data Types – Other Data Types – Variable Declaration – Anchored 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.	13
Unit V	**PL/SQL Cursors and Exceptions:** Cursors – Implicit & Explicit Cursors – Implicit & Explicit Cursor Attributes – Cursor FOR loops – SELECT…FOR UPDATE Cursor – WHERE CURRENT OF Clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. **PL/SQL Composite Data Types:** Composite Data Types – PL/SQL Records – PL/SQL Records – PL/SQL Tables – PL/SQL Varrays. **Named Blocks:** Procedures – Functions – Packages –Triggers –Data Dictionary Views.	13

Text Book:

1. Nilesh Shah, (2009), "Database Systems Using Oracle", 2nd Edition, PHI Publication, Indian Reprint, ISBN-13: 9788120332362.

Reference Books:

1. Arun Majumdar and Pritimoy Bhattacharya, (2007), "Database Management Systems", 1st Edition, TMH, ISBN-13: 9780074622391.
2. Gerald V. Post, (2006), "Database Management Systems", 3rd Edition, TMH Publication, ISBN-13: 9780070635265.
3. Jonathan Gennick, (2005), "Oracle SQLPlus Pocket Reference", 0th Edition, E. H. J. Pallett Publication, ISBN-13: 9788173669330
4. http://freecomputerbooks.com/An-Introduction-to-Relational-Database-Theory.html

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Department	Computer Technology	
Course	B.Sc.(C.T)	**Effective From the Year:** 2017-18
Subject Code & Title	16UCT414 & DATA COMMUNICATION AND NETWORKS	**Semester:** IV
Hrs/Week:	5 Hrs	**Credit:** 4
Objectives	To study about network topologies, TCP/IP, ARP, UDP packets.	
Unit	**Content**	**Hrs**
Unit I	**Introduction to Data Communications and Networking:** Data Communications- Protocols-Analog and Digital Signals. Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing –	13
Unit II	**Transmission Errors:** Detection and Correction. **Transmission Media**: Guided Media, Unguided Media. **Network Topologies**: Mesh, Star, Tree, Ring, Bus. Switching Basics- Circuit switching - Packet switching - Message switching - Router and Routing – Factors affecting Routing algorithm -Approaches to Routing.	13
Unit III	**Network Protocols and OSI Model:** OSI layer Functions. Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) – Integrated Services Digital Network (ISDN) – Frame Relay.	13
Unit IV	**Internetworking Concepts, Devices, Internet Basics, History and Architecture:** Internetworking Devices, Repeaters, Bridges, Routers and Gateways. **An Introduction to TCP / IP, IP, ARP:** TCP/IP Basics, TCP/IP Example, The concept of IP Address, ARP.	13
Unit V	**TCP/IP Part II:** User Datagram Protocol (UDP) - UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email).	13

Text Book:

1. Achyut S.Godbole, (2010), "Data Communications and Networks", Tata McGraw-Hill Publishing Company Limited, ISBN-13: 978-0-07-047297.

Reference Books:

1. Behrouz A. Forouzan, (2007), "Data Communications and Networking", 2nd Edition TataMcGraw-Hill Publishing Company Limited, ISBN-13: 9780070499355.
2. Andrew S. Tanenbaum, (2002), "Computer Networks", 4thEdition, Prentice Hall, ISBN-13:978817781652.
3. http://iit.qau.edu.pk/books/Data%20Communications%20and%20Networking%20By%20Behrouz%20A.Forouzan.pdf

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB V (OPENSOURCE TECHNOLOGIES)

Semester IV

Subject Code: 16UCT415 **Credit: 2**

Total Hrs: 52

1. Find the biggest of 2 numbers.
2. Find the biggest of 3 numbers.
3. Check whether a number is positive or negative.
4. Find the biggest of two numbers using ternary operator.
5. Check whether the given number is odd or even.
6. Find the factorial of a number (while loop)
7. Reverse the digit (Use do while)
8. Find the sum of the digits (Use for loop)
9. Display the Fibonacci series for a particular limit.(Use for loop)
10. Check the given letter is vowel or not.
11. Create an Associative Array with Book Details and Display it in a table.
12. Write a program to create an array and try with all array programs.
13. Find the length of a string.
14. Create a form with one text field and submit buttons for string length, string reverse, uppercase.
15. Write a program of function passing two values and add the two values in the function.
16. Write a program of function showing with return value.
17. Create a registration form which contains fields name, Roll No, Gender and a submit button. All the details should be displayed in the server page when the user clicks the submit button.
18. Write a program to check whether the given number is prime or not.
19. Create Cookie; store a value "Ram" in the cookie.
20. Write a program of Cookie showing expire of cookie

21. Write a program to display the contents of a file. (use fread)
22. Write a program to display the contents of a file. (use fgets)
23. Write a program to display the contents of a file. (use fgetc)
24. Write a program to create a file and write contents to it
25. Write a program to append data to an existing file.
26. Write a program to upload a file and display the contents in server.
27. Write a program for cinema ticketing. All the age should be over 12 years, if less than, don't allow to get ticket.(apply the exception handling)

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB VI – RELATIONAL DATABASE MANAGEMENT SYSTEM

Semester IV

Subject Code: 16UCT416 **Credit: 2**

Total Hrs: 52

1. Write a query for DDL commands.
2. Write a query for DML commands.
3. Write a query for TCL commands.
4. Write a query for NOT NULL, CHECK, UNIQUE constraints.
5. Write a DATE, ARITHMETIC, NUMBER functions in SQL operations.
6. Write a query for JOIN operations.
7. Write a PL/SQL program to find the given number is prime or not.
8. Write a query for set operators.
9. Write a query for grouping a data in SQL.
10. Write a PL/SQL program to display the Fibonacci series for a given number.
11. Write a query for following i) ROWID ii) SYNONYM iii) SEQUENCE.
12. Write a PL/SQL program to check the given number is odd or even.
13. Write a PL/SQL program for user-defined exception to evaluate the commission.
14. Write a PL/SQL program using functions to display the factorial of the given number.
15. Write a PL/SQL program to calculate the average of 1 to 100 numbers.
16. Write a PL/SQL program to reverse a given number.
17. Write a PL/SQL program to check the given string is palindrome or not.
18. Write a PL/SQL block to delete and update using trigger.
19. Write a query for the HAVING clause.
20. Write a query for CONVERSION and GROUP function.

21. Write a PL/SQL program for cursor with parameter.

22. Write a query for GROUP BY clause.

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Department	Computer Technology	
Course	B.Sc. (C.T)	**Effective From the Year:** 2017-18
Subject Code & Title	16UCT4A4 & MICROPROCESSOR AND ALP	**Semester:** IV
Hrs/Week:	5 Hrs	**Credit:**4
Objectives	To know about Intel 8086, Intel 386 and 486 microprocessors, Memory and I/O addressing and MOTOROLA microprocessors.	
Unit	**Content**	**Hrs**
Unit I	**Introduction to Microprocessors**: Evolution of Microprocessors – Single-chip Microcomputer – Embedded Microprocessors – Bit-Slice Processors – Microprogramming – RISC and CISC Processors – Scalar and Superscalar Processors – Vector Processors – Array Processors – Symbolic Processors – Digital Signal Processors. **16-Bit Intel Microprocessors:** Intel 8086 – Pin Description of Intel 8086 – Register organization of 8086 – BIU and EU – Interrupts – 8086 Based Computer System – Addressing Modes of 8086.	13
Unit II	**8086 Instruction Set** – Instruction Groups – Addressing Mode Byte – Segment Register Selection – Segment Override – 8086 Instructions. **Assembly Language Programs for 8086**: Largest Number, Smallest Number in a Data Array – Numbers in Ascending and Descending Order – Block Move or Relocation (Byte Move) – Block Move (Byte Move) using REP Instruction – Sum of a Series:16-Bit, 32-Bit – Multi byte Addition.	13
Unit III	**Intel 386 and 486 Microprocessors**: Intel 386 and 486 Microprocessor – 486DX Architecture – Register Organization of 486 Microprocessor – Memory Organization – Operating Modes of Intel 486 – Virtual Memory – Memory Management Unit – Gates – Interrupts and Exceptions – Addressing Modes of 80486 – Pin Configuration – Input devices – Output devices.	13

Unit IV	**Memory and I/O Addressing – 8086 Addressing and Address Decoding**: Address decoders – ROM addressing decoding - RAM address decoding. **Programmable I/O Ports**: PPI Intel 8255 and Intel 82C55 – Operating modes of 8255 – BSR – Control groups – Control word – DMA Data Transfer. **Other Microprocessors :** Pentium Microprocessors – Pentium Pro Microprocessor – Alpha Microprocessor – Cyrix Microprocessors – MIPS Microprocessors – AMD Microprocessors.	13
Unit V	**MOTOROLA Microprocessors :** MOTOROLA 68000, MOTOROLA 68020, MOTOROLA 68030, MOTOROLA 68040. **Interfacing of A/D Converter and Applications**: Introduction – Interfacing of ADC 0808 or ADC 0809 to Intel 8086 – Bipolar to Unipolar Converter – Sample and Hold Circuit, LF 398 – Microprocessor-based Measurement and Control of Physical Quantities.	13

Text Book:

1. Badri Ram, (2009), "Advanced Microprocessors and Interfacing", Tata McGraw-Hill Publishing Company Limited, ISBN-13:9780070434486.

Reference Books:

1. Ray A.K, Bhurchandi K.M, (2007), "Advanced Microprocessors and Peripherals", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, ISBN: 13-9780070140622.
2. Douglas Hall, (2006), "Microprocessors & Interfacing", McGraw Hill, 2nd Edition, ISBN-13:9781259006159.
3. John Uffenbeck, "The 8086/88 Family: Design, Programming & Interfacing", 1st Edition, PHI, ISBN-13: 9788120309333.
4. http://www.nptel.ac.in/courses/Webcourse-contents/IISc-BANG/Microprocessors%20and%20Microcontrollers/pdf/Lecture_Notes/LNm1.pdf

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based NON-MAJOR ELECTIVE II – OFFICE AUTOMATION LAB

Semester IV

Credit: 2

Subject Code: 16UCT4N3 **Total Hours: 13**

Objective: On Successful Completion of this subject the students should have:

- The ability to work in MS-Office.

MS WORD

1. Type the text, check spelling and grammar, bullets and numbering list items, align the text to left, right, justify and centre.
2. Prepare a job application letter enclosing your bio-data
3. Performing mail merger operation and preparing labels.
4. Preparing a neatly aligned, error free document, add header and footer, also perform find and replace operation.
5. Prepare a document in newspaper column layout

MS EXCEL

7. Worksheet Using formulas
8. Worksheet Manipulation for electricity bill preparation
9. Drawing graphs to illustrate class performance
10. An excel worksheet contains monthly Sales Details of five companies

MS POWER POINT

15. Prepare a power point presentation with at least three slides for Department inaugural function.
16. Draw an organization chart with minimum three hierarchical levels

17. Design an advertisement campaign with minimum three slides

18. Insert an excel chart into a power point slide.

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based NON-MAJOR ELECTIVE II - CORELDRAW LAB

Semester IV

Credit: 2

Subject Code: 16UCT4N4 **Total Hours: 13**

Objective: On Successful Completion of this subject the students should have:

- The ability to work in CorelDraw software.

1. Create a Logo
2. Create a Flower
3. Create a Text effects
4. Create a Olympic Ring
5. Create a Banner
6. Create a Car
7. Create a Invitation
8. Create a Poster
9. Create a Home
10. Create a visiting card

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2018-19
Subject Code & Title	16UCT517 & VB.NET PROGRAMMING	**Semester:** V
Hrs/Week:	5 Hrs	**Credit:** 3
Objectives	To extend knowledge about IDE of Microsoft Visual Basic.NET, Control Structures, Procedures and Arrays, Files and Streams, ADO.NET and Databases.	
Unit	**Content**	**Hrs**
Unit I	**Introduction to Visual Basic .NET**: Visual Basic .NET- Introduction to Microsoft .NET- .NET Framework and the common language runtime. **Introduction to the Visual Studio .NET IDE**: Introduction – Overview of the visual studio .NET IDE - Menu bar and Toolbar –Visual Studio.NET IDE windows. **Introduction to Visual Basic Programming**: Introduction – simple programs – memory concepts- Arithmetic - Decision Making – Using a dialog to display a message.	13
Unit II	**Control Structures**: Introduction – Control Structures- if/then selection structure-if/then/else Selection Structure – While, Do while/loop, Do Until/Loop Repetition Structures – Assignment Operators – For Next – Select Case – do/loop while – do/loop until – exit key word – logical operators. **Procedures:** Introduction – Modules, classes and procedures – sub procedures – function procedures – methods – Arguments Promotion – Option Strict and Data type conversions – value types and reference types – passing arguments: pass – by-value vs. pass-by-reference – duration of identifiers – scope rules.	13
Unit III	**Arrays**: Introduction - arrays - declaring and allocating arrays - examples - passing arrays to procedures - By Val vs By Ref. – for each/next repetition structure. **Graphical user interface concepts:** Introduction **–** windows forms – event handling model – control properties and layout – labels, textboxes and buttons – group boxes and panels – checkboxes and radio buttons – picture boxes – mouse	13

	event handling – keyboard event handling.	
Unit IV	Menus – Link labels – List boxes and Checked list boxes – Combo boxes – Tree views – List views – Tab control –MDI windows – Visual inheritance – User defined controls. **Files and Streams**: Introduction – Data Hierarchy – Files and Streams – Classes File and Directory – Creating a Sequential-Access File – Reading data from a Sequential-Access File - Random-Access Files - Creating a Random-Access File - Writing Data Randomly to a Random-Access File - Reading Data Sequentially from a Random-Access File.	13
Unit V	**Database, SQL and ADO. NET**: Introduction – relational database model- SQL – ADO.NET object model – programming with ADO.NET – extracting from a database – modifying a database - reading and writing XML files. ASP.NET, web forms and web controls: Introduction – simple HTTP transaction – system architecture – web controls – session tracking.	13

Text Book:

1. Deitel H.M, Deitel P.J, Nieto T.R, "Visual Basic.NET How to Program", 2nd Edition, Pearson Education, ISBN-13: 9780130389374.

Reference Books:

1. Kogent Learning Solutions Inc., (2010), ".Net 3.5 Programming: Covering .Net Framework", 1st Edition, DreamTech Press, ISBN-13:9788177228342.
2. Bill Evjen, Jason Beres, et.al, (2002), "Visual Basic.Net Programming – Black Book", Wiley Dream Tech India (p) Ltd. ISBN: 81-265-0254-1.
3. Tim Anderson, "VB.Net programming in Easy Steps", 1st Edition, Dream Tech, ISBN-13: 9788177221930.
4. https://www.syncfusion.com/resources/techportal/details/ebooks/aspnetmultitenant

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Department	Computer Technology	
Course	B. Sc.(C. T)	**Effective From the Year**: 2015-16
Subject Code & Title	16UCT518 & COMPUTER GRAPHICS	**Semester**: V
Hrs/Week:	5 Hrs	**Credit:** 3
Objectives	To develop knowledge about 2D Geometric Transformations and Algorithms, 2D Viewing, 3D Modeling and Transformation.	

Unit	Content	Hrs
Unit I	**Overview of Graphics Systems:** Video display devices – Refresh Cathode-Ray Tubes - Raster Scan Displays - Random Scan Display - Color CRT monitors – Direct – View Storage Tubes – Flat Panel Displays – Three – Dimensional Viewing Devices – Raster Scan System - Random Scan System – Input Devices.	13
Unit II	**Output Primitives**: Points and Lines – Line-Drawing Algorithms – Loading frame Buffer – Line function – Circle-Generating Algorithms. **Attributes of Output Primitives**: Line Attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.	13
Unit III	**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- Point, **Line:** Cohen – Sutherland Line Clipping, Liang – Barsky Line Clipping, Polygon, Curve and Text Clipping	13
Unit IV	**3D Concepts:** 3D Display Methods - 3D Graphics Packages. **3D Object Representation:** Polygon Surfaces – Curved Lines and Surfaces – Blobby Objects.**3D Geometric and Modeling Transformations:** Translation – Rotation – Scaling – Other Transformations.	13
Unit V	**Visible – Surface Detection Methods:** Classification of Visible – Surface Detection Algorithms – Depth –Buffer Method – Scan –Line Method - Depth – Sorting Method- BSP- Tree Method – Area – Subdivision Method – Octree Method – Ray-Casting Method. **Color Models and Color Applications:** Standard Primaries and the Chromaticity Diagram – Intuitive Color Concepts – RGB Color	13

	Model – YIQ Color Model – CMY Color Model – HLS color Model – Color Selection and Applications.	

Text Book:

1. Donald Hearn, M.Pauline Baker, (1997), "Computer Graphics", PHI, 2nd edition, ISBN: 81-23-0944-8.

Reference Books:

1. Agarwal, Udit, (2010), "Computer Graphics", S.K. Kataria & Sons**,** 2nd Edition**,** ISBN-13: 9789380027708.
2. Xiang, Plastock, Avadhani, (2006), "Computer Graphics", McGraw Hill, 2nd Edition, ISBN-13: 9780070601659.

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2018-19
Subject Code & Title	16UCT519 & SOFTWARE ENGINEERING	**Semester**: V
Hrs/Week:	5 Hrs	**Credit:** 5
Objectives	To communicate information about software development approaches, process models, requirement engineering, building analysis model, design methodologies and software testing.	
Unit	**Content**	**Hrs**
Unit I	**Introduction to Software Engineering**: The evolving role of software - Changing Nature of Software - Software myths. **A Generic view of process**: Software engineering - A layered technology - a process framework - The Capability Maturity Model Integration (CMMI). **Process models**: The waterfall model - Incremental process models - Evolutionary process models - The Unified process.	13
Unit II	**System Engineering**: Computer-Based Systems – the system engineering Hierarchy – System Modeling. **Requirements Engineering:** A bridge to design and construction- Requirements Engineering Tasks – Initiating the Requirements Engineering Process - Eliciting Requirements – Building the Analysis Model.	13
Unit III	**Building the Analysis Model**: Requirement analysis – analysis Modeling approaches – Data modeling concepts – Object-Oriented Analysis- Scenario-Based Modeling – Flow-Oriented Modeling – Class-Based Modeling – Creating a Behavioral Model.	13
Unit IV	**Design Engineering**: Design process and Design quality - Design concepts - the design model. **Creating an architectural design**: Software architecture - Data design - Architectural styles and patterns - Architectural Design – Mapping Data Flow into a Software Architecture.	13

Unit V	**Testing Strategies**: A strategic approach to software testing, Test strategies for conventional software, Validation testing, System testing, The art of Debugging **Testing Tactics**: Black-Box and White-Box Testing - White- Box Testing - Basis path Testing – Control Structure Testing - Black-Box Testing.	13

Text Book:

1. Roger S. Pressman, (2005), "Software Engineering, A Practitioner's Approach", 6th Edition, TATA McGraw-Hill Publications, ISBN: 007-124083-7.

Reference Books:

1. Ian Sommerville, (2004), "Software Engineering", 7th Edition, Addison Wesley, ISBN-13: 978-0321210265.
2. Stephen Schach, (2007), "Software Engineering", 7th Edition, New Delhi, Tata McGraw Hill Publishing Company, ISBN-13: 9780070647770.
3. http://www.slideshare.net/rhspcte/software-engineering-ebook-roger-s-pressman

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2018-19
Subject Code & Title	16UCT520 & CLOUD COMPUTING	**Semester:** V
Hrs/Week:	5 Hrs	**Credit:** 5
Objectives	To make out facts about cloud computing, developing cloud services, Cloud Storage, Cloud Computing at Work, Cloud computing Security Issues and Challenges etc.	

Unit	Content	Hrs
Unit I	Cloud computing Basics: Cloud Computing Overview – Applications – Internet and the Cloud – First Movers in the Cloud. **Your Organization and cloud computing:** Benefits – Limitations - Security Concerns.	12
Unit II	**Cloud Computing Technology:** Hardware and Infrastructure – Clients – Security – Network – Services. **Accessing the cloud:** Platforms – Web Applications – Web APIs – Web Browsers. **Cloud Storage:** Overview – Cloud storage providers – Standards.	13
Unit III	**Cloud Computing Services:** Infrastructure as a service – Platform as a service – Software as a service – Software plus services. Business Applications – Operational Benefits – Economic Benefits – Tips for Evaluating SaaS – Staffing Benefits. Deleting your Datacenter. **Cloud Services:** Google – Microsoft – Amazon – IBM.	14
Unit IV	**Cloud Computing at Work:** Overview – Driving forces – Company Offerings – Industries. **Software plus services:** Overview – Mobile device Integration – Providers – Microsoft online. **Local clouds and thin clients:** Virtualization in your organization - Server solutions – Thin Clients.	13
Unit V	**Migrating to the cloud:** Cloud services for Individuals – Enterprise – class cloud Offerings – Migration. **Future of Cloud Computing:** Analyze your services – Best Practices – Evolution of Cloud Computing in Future. Cloud computing Security Issues and Challenges.	13

Text Book:

1. Anthony T.Velte, Toby J.Velte, Robert Elsenpeter (2010), "Cloud Computing: A Practical Approach", Tata McGraw-Hill, 1st Edition, ISBN-13: 978-0-07-068351-8.

Reference Books:

1. Michael Miller, (2008), "Cloud Computing: Web-Based Applications That Change the way you work and Collaborate Online", Macmillan Computer Publication, 1st Edition, ISBN-13: 9780789738035.
2. http://cs.ecust.edu.cn/~yhq/course_files/cloud/Cloud%20Computing%20Bible.pdf

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB VII (VB.NET PROGRAMMING)

Semester V

Subject Code: 16UCT521 **Credit: 2**

Total Hrs: 52

VB.NET – Console Application

1. Create a Console Application for a simple stack operation in VB.Net
2. Create a Console Application for a simple queue operation in VB.Net
3. Develop a console application to illustrate the concept of exception handling using VB.Net
4. Develop a console application to illustrate the concept of Hash table using VB.Net
5. Develop a console application to illustrate the concept of Inheritance
6. Develop a console application to illustrate the concept of File handling

VB.NET – Windows Application

7. Develop a Windows Form Application to generate the Bio-Data of a student
8. Develop a Windows Form Application to illustrate the concept of Tree-Node Control
9. Develop a Windows Form Application to perform the operations of a calculator
10. Develop a Windows Form Application to calculate and generate a telephone a bill
11. Develop a Windows Forms application to create and generate an E.B. Bill
12. Develop a Windows Form application to for performing the operations of a Banking System.
13. Develop a windows forms application to create a notepad.
14. Create a Windows form application to develop a Basic Login form
15. Create a Windows Form application to develop an Employee Pay slip
16. Create a Windows Form application to develop a Vehicle invoice generation System
17. Create a Windows Form application to develop a Library book issue details system.

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB - VIII (GRAPHICS AND MULTIMEDIA)

Semester V

Subject Code: 16UCT522 **Credit: 2**

Total Hrs: 52

Graphics:

1. Write a C program to generate a line using DDA Algorithm.
2. Write a C program to generate a line using Bresenham's Line Drawing Algorithm.
3. Write a C program to generate a circle.
4. Write a C program to generate a circle using Mid-point Circle Algorithm.
5. Write a C program to generate an ellipse using Mid-point Ellipse Algorithm.
6. Write a C program to generate different types of lines.
7. Write a program to generate a chessboard using graphics.
8. Illustrate the concept of translation, scaling, rotation.
9. Write a C program for window–to-viewport conversion.
10. Write a C program to illustrate the concept of 2D Reflection.

Multimedia:

11. Create a Sunflower using Adobe Photoshop.
12. Create a Poster using Adobe Photoshop.
13. Enable an onion skin concept using Adobe Photoshop.
14. Create a Calendar using Adobe Photoshop.
15. Create Morphing effects by using Adobe Photoshop.
16. Create a Webpage using Adobe Photoshop.
17. Animate a Flying Butterfly using Macromedia Flash 8.
18. Animate shapes using Macromedia Flash 8.
19. Animate text using Macromedia Flash 8.
20. Animate a Fog effect using Macromedia Flash 8.

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based MAJOR ELECTIVE I – HTML5 with CSS LAB

Semester V

Credit: 2

Subject Code: 16UCT5S1 **Total Hours: 13**

Objective: On Successful Completion of this subject the students should have:

- The ability to develop web based applications in HTML5 and CSS

1. Write a Program to add new elements in HTML.
2. Write a Program to illustrate <section> element in HTML.
3. Write a Program to illustrate <nav> element in HTML.
4. Write a Program to illustrate <fig> and <fig caption>element in HTML.
5. Write a program to draw a Circle using canvas tag.
6. Write a program to fit an image in a cell using canvas tag.
7. Write a program to draw a star using SVG.
8. Write a program to include video/Audio file in html page
9. Write a program to Drag and Drop the content in HTML.
10. Write a program to illustrate Web Workers in HTML.
11. Write a program for setting different background color for elements using CSS.
12. Write a program for setting different right side border in CSS.
13. Write a program for setting the color for visited/unvisited links using CSS.
14. Write a program for setting the height and width of an image using % in CSS.

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based MAJOR ELECTIVE I - VISUAL BASIC LAB

Semester V

Credit: 2

Subject Code: 16UCT5S2 **Total Hours: 13**

Objective: On Successful Completion of this subject the students should have:

- The ability to develop applications using Visual Basic.

1. Create a program to perform arithmetic operations.
2. Create a program to count the number of characters in the given String.
3. Create a program for application form of UG courses in visual basic.
4. Create a program to perform arithmetic operations using calculator.
5. Create a program to perform various string functions.
6. Create a program to select items from the list box.
7. Create a program to perform Quiz in visual basic.
8. Create a program to compute simple interest and compound interest in visual basic.
9. Create a menu editor form in visual basic.
10. Create an application to Maintain Student Details in visual basic.
11. Create an application to maintain Departmental store Details in visual basic.
12. Create an application to maintain Library Details in visual basic.

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2018-19
Subject Code & Title	16UCT623 - J2EE TECHNOLOGIES	**Semester:** VI
Hrs/Week:	6 Hrs	**Credit:** 4
Objectives	To develop knowledge about JApplet, Java Servlets, Servlet chains and Server pages.	
Unit	**Content**	**Hrs**
Unit I	Tour of Swing: JApplet- Icons and Labels – Text Fields – Buttons – Combo Boxes - Tabbed Panes – Scroll Panes – Trees – Tables – Exploring Swing.	15
Unit II	Servlet Overview and Architecture, Movement to Server-Side Java – Java Servlet - Practical applications for Java Servlets – Java Servlet Alternatives – Reasons to Use Java Servlets – Java Servlet Architecture. Servlet Basics – The Life Cycle of a Servlet – A Basic Servlet – Basic Servlet Source – Building and Installing the Basic Servlet – The HTML Required to Invoke the Servlet – Dissecting the Basic Servlet.	16
Unit III	Server-Side includes - Servlet chaining: Uses for Servlet chain - Invoking a Servlet Chain– A practical Example using Servlet Chaining. Servlets and JDBC – Two and Three-tier Database Access Models – JDBC Driver Types – JDBC Basics – A Basic JDBC Servlet.	16
Unit IV	JSP – Conditions – Directives – Declarations- Implicit Variables – Scriptlets – Expressions. Servlet Sessions: Session Tracking – Working with Cookies.	15
Unit V	Java Beans– Advantages of Java Beans – Application Builder tools – The BDK – JAR Files – Introspection - Developing a simple bean – Using Bound Properties – Using the Bean Info Interface – Constrained properties – Persistence – Customizer – The Java Beans API.	16

Text Books:

1. Herbert Schildt (2002), "JAVA 2: The Complete Reference", 5th Edition, Tata-McGraw Hill, ISBN-13: 9780070495432.
2. James Goodwill, (1999), "Developing Java Servlets", 1st Edition, Techmedia, ISBN 81-7635-325-6.

Reference Books:

1. Subrahmanyam Allaramaju, Cedric Buest , Marc Wilcox, Sameer Tyagi ,(2001), "Professional Java Server Programming J2EE", 1.3 Edition, WROX Press Ltd, ISBN-13: 978-1861005373.
2. Jayson Falkner and Kevin Jones, (2003), "The J2EE Technology Web Tier", Addison-Wesley Professional, 1st Edition, ISBN-13: 978-0321136497.
3. http://nomembershipreqiered.net/j2ee-complete-reference-herbert-schildt-pdf-free-download-t9443.html

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2018-19
Subject Code & Title	16UCT624 & EMBEDDED SYSTEMS	**Semester:** VI
Hrs/Week:	6 Hrs	**Credit:** 5
Objectives	To teach essentials about Embedded Systems on chip, Device Drivers and Interrupt Service Mechanism and Real time operating systems.	
Unit	**Content**	**Hrs**
Unit I	**Introduction to Embedded System**: Embedded System – Processor Embedded into the System – Embedded Hardware units and Devices in a System – Embedded Software in a system – Examples of embedded system – Embedded system on chip and use of VLSI circuit - Classification of embedded systems – Skills required for an embedded System Designer.	16
Unit II	**Devices and buses for device networks**: I/O Types and Examples – Serial Communication devices: Synchronous, Iso-Synchronous and Asynchronous communication from serial devices – Parallel Device Ports - Timer and counting devices – Watchdog timer – Real time clock – Network Embedded Systems – Serial Bus Communication Protocol.	15
Unit III	**Device drivers and Interrupts servicing mechanism**: Device drivers – Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency – Device Driver Programming: – Parallel port device drivers – Serial port device drivers – Device drivers for IPTD.	16
Unit IV	**Programming concepts and embedded programming in C and C++**: Embedded programming in C++ and in Java. **Program modeling concepts in single and multi processor systems**: Program Models – DFG Models – State Machine Programming Models for Event-controlled Program Flow – Modeling of Multiprocessor Systems	15

Unit V	**Inter – process communication and synchronization of processes. Tasks and threads:** Multiple processes in an application – Multiple Threads Shared Data – Inter process communication. **Real time operating systems**: Operating system services – I/O subsystem – Real time operating systems – Basic Design using RTOS – RTOS Task scheduling Models, Interrupt Latency and Response of the Tasks as Performance Metrics.	16

Text Book:

1. Raj Kamal, (2011), "Embedded Systems – Architecture, Programming and Design", 2nd Edition, TMH, ISBN-13:978-0-07-066764-8.

Reference Books:

1. Daniel W. Lewis, (2007), "Fundamentals of Embedded Software", 1stEdition, PHI Education Publications, ISBN: 81-7808-604-2.
2. Shibu K V, (2009), "Introduction to Embedded Systems", 1st Edition, McGraw Hill Education, ISBN-13: 9780070145894.
3. http://www.dauniv.ac.in/downloads/EmbsysRevEd_PPTs/Chap01Lesson_1Emsys.pdf

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Department	Computer Technology	
Course	B. Sc. (C. T)	**Effective From the Year:** 2018-19
Subject Code & Title	16UCT625 & CYBER SECURITY	**Semester:** VI
Hrs/Week:	6 Hrs	**Credit:** 5
Objectives	To develop the knowledge about Cyber Security and Cryptography, Symmetric Key Algorithms, Asymmetric Key Algorithms and electronic mail policy.	
Unit	**Content**	**Hrs**
Unit I	**Attacks On Computers And Computer Security**: Introduction – Need For Security –Types Of Attacks. **Cryptography - Concepts and Techniques:** Introduction – Plain Text and Cipher Text – Substitution Techniques - Transposition Techniques – Encryption and Decryption.	15
Unit II	**Symmetric Key Algorithms**: Introduction – Algorithm Types – An Overview Of Symmetric Key Cryptography – **Data Encryption Standard (DES)**: How DES Works? **Asymmetric Key Algorithms, Digital Signature And RSA**: Introduction – An Overview Of Asymmetric Cryptography - The RSA Algorithm.	16
Unit III	**Digital Certificate And Public Key Infrastructure (PKI)**: Digital Certificates: Introduction – The Concept of Digital Certificate – Certificate Authority – Technical Details. The PKIX Model. **Internet Security Protocols:** Introduction – Basic Concepts – Secure Socket Layer – (SSL) – Secure Hyper Text Transfer Protocol (SHTTP).	16
Unit IV	**Email Security: PGP –** How PGP Works? **- S / MIME: Introduction –** Cryptographic Algorithms used in S/MIME – Security in GSM –Security in 3G.**User Authentication And Kerberos:** Introduction – Authentication Basics – **Passwords:** Introduction – Clear Text Passwords - Kerberos.	15

Unit V	**Cryptography In JAVA**: Introduction – Cryptographic Solution Using JAVA. **Network Security Firewalls And Virtual Private Networks** (VPN): Introduction – Brief Introduction To TCP/IP – **Fire Walls**: Introduction – Types of Firewalls. Virtual Private Networks (VPN) – Intrusion.	16

Text Book:

1. Atul Kahate, (2007), "Cryptography and Network Security", 2nd Edition, Tata McGraw-Hill Publication, and ISBN-13: 9780070648234.

Reference Books:

1. Mark Rhodes-Ousley, Roberta Bragg, Keith Strassberg, (2004), "Network Security: The Complete Reference", Tata McGraw-Hill. ISBN: 0-07-222697-8.
2. William Stallings, (2006), "Cryptography and Network Security Principles and Practices", 4th Edition, ISBN: 978-81-203-3018-4.
3. Brijendra singh, (2009), "Network Security and Management", 2nd Edition, PHI Publication, ISBN - 13: 9788120339101.
4. https://www.scribd.com/doc/159080504/Cryptography-Network-Security-Atul-Kahate

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DEPARTMENT OF COMPUTER TECHNOLOGY

PROGRAMMING LAB - IX (J2EE TECHNOLOGIES)

Semester VI

Subject Code: 16UCT626 **Credit: 2**

Total Hrs: 65

1. Create JTextField and JButton Component for displaying pizza order.
2. Create a program to illustrate the concept of JCheckBox class.
3. Create a program to illustrate the concept of JRadioButton class.
4. Create a JComboBox component for displaying images.
5. Create a JTabbedPane component for displaying login form details.
6. Create a JScrollPane component for displaying provisionary items.
7. Create a JTree component for displaying the list of files and folders in C drive.
8. Create a JTable component for displaying student details.
9. Create a Game login form using various components.
10. Create a JugglerBean.
11. Create a MoleculeBean.
12. Create a program to illustrate the concept of Introspection.
13. Create a bean program to design a simple property of the bean.
14. Create a java program to illustrate the concept of Generic Servlet.
15. Create a java program to illustrate the concept of Http Servlet.
16. Create a java program to illustrate the concept of Servlet chaining.
17. Create a java program to illustrate the concept of Server-side Includes.
18. Create a java program to illustrate the concept of Request Object Method.
19. Create a java program to illustrate the concept of JDBC Connectivity.
20. Create a jsp program to illustrate the concept of Implicit Objects.
21. Create a program to find the factorial of a given number using JSP Conditions.

22. Create a program to illustrate the concept of JSP Directives.

23. Create a program to illustrate the concept of JSP Expressions.

24. Create a program to illustrate the concept of Sessions in JSP.

25. Create a program to illustrate the concept of Cookies in JSP.

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DEPARTMENT OF COMPUTER TECHNOLOGY

GUIDELINES FOR INDUSTRY ORIENTED PRACTICALS

Semester VI

Subject Code: 16UCT627 **Credit: 4**

Objectives:

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- 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.
- The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned.

University Exam will be conducted as follows.

- Both the Internal (Respective Guides) and External Examiners should Conduct the Viva-Voce Examination at the last day of the practical session.
- No candidate will be allowed to change the title of the Project work after the completion of End- semester Viva.
- For those absent on genuine grounds a common supplement End-Semester Viva-voce may be conducted at our College by obtaining prior permission from the COE on the recommendations from the HOD before the commencement of the next semester Final Viva.
- Out of 100 marks, 40 (4 Reviews, each carries 10 marks) for Project Evaluation and 60 for Viva.
- For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based MAJOR ELECTIVE II – DATA ANALYTICS (BIG DATA)

Semester VI

Subject Code: 16UCT6S3 **Credit: 2**

Total hrs: 13

1. Illustrates how to create a basic spreadsheet by entering text, numbers, and formulas.
2. Illustrate the formatting of cells and columns.
3. Create a spreadsheet to perform "what if?" calculations using Built-in functions.
4. Demonstrate the ease of creating charts.
5. Sort the data and print portions of a worksheet.
6. Illustrates how to dress up a table using special formats and how to export a table or chart into a Microsoft Word document.
7. Demonstrate a basic cost-benefit analysis using Excel.
8. Consolidate several worksheets into one and to link several worksheets to a master worksheet.
9. Illustrate the use of analysis tools for conducting bivariate regression and forecasting.
10. Use a worksheet to calculate descriptive statistics (e.g., mean, standard deviation).
11. Estimate a bivariate regression equation and related summary statistics.

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DEPARTMENT OF COMPUTER TECHNOLOGY

Skill Based MAJOR ELECTIVE II - DREAMWEAVER LAB

Semester VI

Subject Code: 16UCT6S4 **Credit: 2**

Total hrs: 13

Using Dreamweaver,

- Creating a picture gallery
- Creating template
- Creating CSS text rollover
- Creating Mail-To links
- Creating website
- Creating a link to different pages from the same image
- List Menus
- Submit buttons
- Creating Links without an Underline using CSS Styles
- Using CSS Styles
- Working PHP, CSS, JavaScript, JSP, HTML in Dream Weaver.

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