

DEPARTMENT OF COMPUTER SCIENCE

**Nallamuthu Gounder Mahalingam College
(Autonomous)
(An ISO 9001:2008 Certified Institution)
Re-Accredited with 'A' Grade by NAAC
Pollachi-642001**



SYLLABUS

**B. Sc. COMPUTER SCIENCE
BATCH 2017-2020**

B.Sc. – COMPUTER SCIENCE DEGREE COURSE
(FOR THE CANDIDATES ADMITTED FROM THE ACADEMIC YEAR 2017 ONWARDS)
I & II SEMESTERS : SCHEME OF EXAMINATIONS

Part	Course Code	Title of the Paper	Hrs	Dur. Hrs	MAX.MARKS			Credits
					CIA	ESE	Total	
<u>I SEMESTER</u>								
I	17UTL101/ 17UHN101/ 17UFR101	Tamil Paper-I/ Hindi Paper-I/ French Paper-I	6	3	25	75	100	3
II	17UEN101	English Paper-I	6	3	25	75	100	3
III	17UCS101	Core I: Programming in C	4	3	25	75	100	4
	17UCS102	Core II: Digital Computer fundamentals and organization	4	3	25	75	100	4
	17UCS1A1	Allied-1: Mathematics-I	4	3	25	75	100	4
	17UCS103	Core Lab I: Programming Lab in C	4	3	20	30	50	2
IV	17HEC101	Human Excellence: Personal Values& SKY Yoga Practice-1	1	2	25	25	50	1
	17UHR101	Human Rights in India	1	2	-	50	50	2
V		Extension Activities (NSS, NCC, Sports & Games)						
Total							650	23
<u>II SEMESTER</u>								
I	17UTL202/ 17UHN202/ 17UFR202	Tamil Paper-II/ Hindi Paper-II/ French Paper-II	6	3	25	75	100	3
II	17UEN202	English Paper – II	5	3	25	75	100	3
III	17UCS204	Core III: Object Oriented Programming Using C++	4	3	25	75	100	4
	17UCS205	Core IV: Data and File Structure	4	3	25	75	100	4
	17UCS2A2	Allied -2: Mathematics-II (Discrete Mathematics)	4	3	25	75	100	4
	17UCS206	Core Lab II: Programming Lab in C++	4	3	20	30	50	2
IV	17HEC202	Human Excellence: Family Values& SKY Yoga Practice-2	1	2	25	25	50	1
	17EVS201	Environmental Studies	2	2	-	50	50	2
V		Extension Activities (NSS, NCC, Sports & Games)						
Total							650	23

Bloom's Taxonomy Based Assessment Pattern**K1-Remember; K2- Understanding; K3- Apply; K4-Analyze; K5- Evaluate****1. Part I,II & III--Theory: 75 Marks****(i) TEST- I & II and ESE:**

Knowledge Level	Section		Marks	Description	Total
K1	A(Answer all)	Q.1 to 5	10x1=10	MCQ	75
		Q.6 to 10		Define	
K2	B (Either or pattern)	Q.11 to 15	5x5=25	Short Answers	
K3 & K4	C (Answer 4 out of 6)	Q.16 is compulsory Q.17 to 21 (Answer 3 out of 5)	4x10=40	Descriptive/ Detailed	

2. Part IV--Theory: 50 Marks

Knowledge Level	Section		Marks	Description	Total
K1	A(Answer all)	Q.1 to 5	10x1=10	MCQ	50
		Q.6 to 10		Define	
K2, K3 & K4	B (Answer 5 out of 8)	Q.11 to 18	5 x 8=40	Descriptive/ Detailed	

3. Practical Examinations:

Knowledge Level	Section	Marks	Total
K3	Practical & Record work	30	50
K4		20	
K5			

Note:

- Question paper pattern for Non-Major Elective(NME) Practical Paper (Maximum Marks: 50 Marks)
 - Two questions from Computer Science Practical - 40 marks
 - Marks for Record - 10 marks

Components of Continuous Assessment

Components		Calculation	CIA Total
Test 1	75	$\frac{75+75+25}{7}$	25
Test 2	75		
Assignment/Seminar	25		

Programme Outcomes

PO1: To inculcate the strong fundamentals of mathematics and to develop competence in computer science.

PO2: To trigger the creativity and programming skills with enhanced knowledge and hands-on practical skill.

Programme Specific Outcomes

PSO1: To impart mathematical foundations of the algorithmic approach and computer science theory in the sculpting and design of computer based systems.

PSO2: Ability to apply the computer science knowledge in all domains and to inculcate strong problem solving skills through the courses of Computer Science.

PSO3: Ability to propose creativity and solutions, and to design modern, user-friendly applications that are greatly useful to the society.

PSO4: Ability to train the students in project based assignments as well as to analyze and interpret data.

PSO5: To impress upon students the importance of good ethical practices, right professional conduct and responsible team leadership, and to develop and update the skill required for IT industry.

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS101	Title:	Batch :	2017-2020
Hrs/Week:	04	Core I: Programming in 'C'	Semester:	I
			Credits:	04

Course Objective

The course objective is to know the basic components of the computer and working of each device, the student gain experience about structured programming, understand the implementation of C language and understand various features in C.

Course Outcomes (CO)

K1	CO1	To keep in mind the fundamentals of C programming
K2	CO2	To understand the loops and decision making statements to solve the problem
K3	CO3	To implement different operations on arrays and use functions to solve the given problem.
K4	CO4	To review the C program that uses pointers, structures and files

Syllabus

Units	Contents	Hrs
Unit I	Fundamentals of Computers : Introduction–History of Computers–Generations of Computers– <i>Classification of Computers</i> –Basic Anatomy of a Computer System–Input Devices–Processor–Output Devices–Memory Management–Types of Software–Overview of Operating System–Programming Languages–Translator Programs–Problem Solving Techniques. Introduction to C – Constants – C character set – Delimiters – Keywords – Identifiers – Constants– Variables – Rules for defining variables- Data types, – Declaring and initializing variables – Type conversion– Operators – precedence of arithmetic – operators precedence & associativity – expressions – Mathematical functions - Input/Output statements.	10
Unit II	Control Statements: IF, IF..ELSE Statements, ELSE...IF ladder – Switch Statement – GOTO Statement – WHILE Statement – Do Statement – FOR Statement – Jumps in Loops –Flowchart Symbols Arrays: One dimensional Arrays – Two Dimensional Arrays – Multi Dimensional Arrays – Structures – Arrays within Structures – Structures within structures – Structures and Functions– Union – Size of structures. Characteristics of Arrays & String manipulation: Introduction - Declaring & Initializing variables – Reading string from terminal, writing string to screen – Arithmetic operations and characters– string handling Functions.	10
Unit III	Functions: User-defined functions- A-Multi-function programme- Elements of user defined function, definition of function-return value & their types, function calls & declarations-category of functions: No arguments & No return values-arguments that No return values – arguments with return values-No arguments that return a value-Nesting of functions-recursion & passing arrays & strings to functions. The scope, Visibility and lifetime of Variables in functions.	11
Unit IV	Pointers: Introduction-Accessing, Declaring & Initializing pointer variables-Chain of pointers-Pointer expression, increments-Pointer Arrays-Pointers and Character strings-Array of pointers-Pointers as function arguments-function returning pointers-pointers to functions-Pointers and Structures-Troubles with pointers.	10

Unit V	Files: Defining and opening a file – Closing a file –I/O operations of file – Error handling during I/O operations – Random access files – Command line argument-preprocessor – Macro Substitution – File Inclusion – Compiler control directives.	9
	Total Contact Hrs	50
	<i>*Italicized</i> texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1.E.Balagurusamy, “Programming in Ansi C”, Tata McGraw-Hill Publishing Company Ltd., Sixth Edition, 2016. 2.E Balagurusamy, “Computing fundamentals & C programming” ,Tata McGraw-Hill, Second Reprint 2008.	
REFERENCES	1. Yaswanth Kanishkar, “LET US C”, BPB Publications, Seventh Edition, 2007. 2.Byron Gottfried,”Proramming with C”,Schaum’s Outlines series, Second Edition, 1996 3.Ashok N. Kamthane, “Programming with ANSI and Turbo C”,Seventh Impression,2009	

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	M
CO2	M	S	S	S	S
CO3	M	S	S	S	S
CO4	S	S	S	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
Dr. M. Sakthi	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Durairaju	Name: Dr.R.Muthukumaran
M.Malathi	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS102	Title:	Batch :	2017-2020
		Core II: Digital Computer Fundamentals and Organization	Semester:	I
Hrs/Week:	4		Credits:	04

Course Objective

On completion of this course, the students can understand the design of combinational and sequential digital logic circuits. Students will also have knowledge on Programmable Logic devices and its usage.

Course Outcomes (CO)

K1	CO1	To recollect the fundamental concepts and techniques used in digital electronics.
K2	CO2	To get the idea of basic postulates of Boolean Algebra and to apply the methods of simplifying Boolean expressions
K3	CO3	To apply knowledge about internal circuitry and logic behind any digital system and to design various synchronous and asynchronous circuits.
K4	CO4	To analyze the concept of memories, and to introduce microcontroller case study.

Syllabus

Units	Contents	Hrs
Unit I	Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal –Binary addition, Multiplication, Division –Floating point representation, Complements, BCD, Excess3, Gray Code. Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Half subtractor, Full subtractor, Parallel binary subtractor -Digital Logic: the Basic Gates –NOR, NAND, XOR Gates.	10
Unit II	Combinational Logic Circuits: Boolean algebra –Karnaugh map –Canonical form 1 –Construction and properties –Implicants –Don't care combinations -Product of sum, Sum of products, simplifications. Sequential circuits: Flip-Flops: RS, D, JK, and T-Multiplexers –Demultiplexers –Decoder Encoder –shift registers-Counters.	11
Unit III	Input –Output Organization: Input –output interface –I/O Bus and Interface –I/O Bus Versus Memory Bus –Isolated Versus Memory –Mapped I/O –Example of I/O Interface. Asynchronous data transfer: <i>Strobe Control and Handshaking</i> –Priority Interrupt: Daisy -Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMAController, DMA Transfer. Input –Output Processor: CPU-IOP Communication.	10
Unit IV	Memory Organization: <i>Memory Hierarchy</i> –Main Memory-Associative memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping –Writing into Cache Initialization. Virtual Memory: Address Space and Memory Space, Address Mapping Using Pages, Associative Memory, Page Table, Page Replacement	9
Unit V	CASE STUDY: Pin out diagram, Architecture, Organization and addressing modes of 80286-80386-80486-Introduction to microcontrollers.	10
	Total Contact Hrs	50

	<i>*Italicized</i> texts are for self study	
	Power point Presentations, Seminar, Assignment and Case study	
TEXT BOOKS	1. M.Morris Mano, “Computer System Architecture”, Prentice Hall of India, Third Edition,2007 2.Albert Paul Malvino, Donald P Leach ,“Digital Principles and Applications”, TMH,1996 3.Ramesh S Goankar, “Microprocessors and its Applications”, 2013	
REFERENCES	1.V .K Puri ,“ Digital Electronics”, Tata McGraw Hill, Reprint 2011. 2.A.P.Godse, D.A.Godse, “Digital Computer Fundamentals”, Technical Publications, First Edition 2007 3. M.Carter , “ Computer Architecture”, Schaum’s outline series,TMH,2002	

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	M
CO2	H	S	S	S	H
CO3	H	S	S	S	S
CO4	H	S	S	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
R. Deepa	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Durairaju	Name: Dr.R.Muthukumaran
K. Kannika Parameswari	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS1A1	Title :	Batch :	2017-2020
		Allied-1: Mathematics-I	Semester:	I
Hrs/Week:	4		Credits:	04

Course Objective

To make the students to understand and apply the central tendencies deviation, correlation, probability, Statistical Inference tests - To enable the students to solve linear algebra existences, numerical integration and differential equation using numerical methods.

Course Outcomes (CO)

K1	CO1	To recollect the definition of matrix and determinants and perform various operations on it
K2	CO2	To evaluate various Numerical Methods problems and find better result based on given information
K3	CO3	To understand different sampling test techniques such as t-test and F-variance ratio test for Large sample and Small sample
K4	CO4	To figure out appropriate statistical methods like Mean, Median, Mode and apply them in various data analysis problems

Syllabus

Units	Contents	Hrs
Unit I	Matrices –Introduction –Determination –Inverse of a matrix –Rank of a Matrix–Eigen value Problems.	10
Unit II	Statistics: Mean, Median, Mode, Range, Quartile Deviation, <i>Standard Deviation</i> , Rank Correlation, Co-efficient of Correlation, Regression.	10
Unit III	Large Sample test: Standard error- Test of Significance of Large Samples – Tests for (i) single proportion (ii) Difference of two proportions (iii) difference of two means (iv) difference of two standard deviations.Small sample test based on t, – t-test for (i) single mean (ii) Difference of two means (iii) Observed sample correlation co-efficient. F- Variance Ratio Test	10
Unit IV	Probability: <i>Permutation</i> , combination, trail, event, sample space, mutually exclusive cases, exhaustive events, Independent events, dependent events, simple and compound events. Measurement: Classical, relative frequency, theory of probability, Limitations, personalistic view of probability and Axiomatic Approach of probability, addition and multiplication theorem, odds, miscellaneous illustrations question	11
Unit V	Numerical Methods: Gauss-Seidal method for linear algebric system-Newton’s Rapshon method for polynomial system-Newton forward and backward interpolation-Trapezoidal rule-Simpson 1/3 rule and 3/8 rule for Numerical Integration.	9
	Total Contact Hrs	50
	<i>*Italicized texts are for self study</i>	
	Power point Presentations, Seminar, and Assignment	

TEXT BOOKS	1. Dr. M.K.Venkataraman , “Engineering Mathematics”, National Publishing Company, Chennai. 2.RSN Pillai & Bagavathi , “Statistics Theory and Practice”, S.Chand& Company Ltd. July 2011 3. P.Kandasamy, K.Thilagavathy, K.Gunavathy, “Numerical Methods”, Sultan Chand & Co. Ltd., Third Edition,2002.
REFERENCES	1. S.P. Gupta, “Statistical Methods”, Sultan Chand & Sons Publishers, Thirty-third Edition, 2002. 2. M.Venkatraman, “Numerical Methods in Science and Engineering”, The National Publications, Fifth Edition,1999. 3. “Computer Oriented Statistics and Numerical Methods”, S.Chand and Co Delhi. 2009

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	S	H
CO3	M	S	S	M	M
CO4	M	H	H	L	H

S- Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
K. Srinivasan	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Durairaju	Name: Dr.R.Muthukumaran
R. Revathi	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS103	Title :	Batch :	2017-2020
		Core Lab I: Programming Lab In 'C'	Semester:	I
Hrs/Week:	4		Credits:	02

Course Objective

The purpose of this course is to introduce students to the field of programming using C language. The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes (CO)

K3	CO1	To implement different operations on arrays and use functions to solve the given problems.
K4	CO2	To evaluate the C program that uses pointers, structures and files
K5	CO3	To validate programs with pointers and arrays, perform pointer arithmetic, and use the pre processor

Syllabus

Units	Contents	Hrs
	SET A • Program to find the greatest number among n numbers. • Program to Generate a Fibonacci series. • Program to check whether the given number is Armstrong number or not. • Program to find Prime numbers between a given range. • Program for finding Sum of individual digits. • Program to display the Numbers in Ascending order. • Program to display the Numbers in Descending order. • Program to display the Names in Alphabetic order. • Program to find whether a given string is a palindrome or not • Program to calculate the Matrix addition. • Program to calculate the Matrix multiplication. • Program to illustrate the concept of structures. SET B • Program to find the values of the following Series Sin(X), Cos(X), E^x, Log(1+X). • Program to perform the Sequential search. • Program for Binary search. • Program to generate the Piglatin. • Program to find a Mean, median & mode for given values. • Program to find Standard deviation & variance for given values.	

	• Program to find the Transpose of a Matrix. • Program to count vowels, consonants, white spaces in a given sentence. • Program to illustrate the concept of Pointers. • Program to illustrate the concept of subroutine functions. • Program to create a file. • Program for processing a file. • Program using command line arguments													
	INTERNAL MARK (20 Marks) <table><tr><td>Observation Record Note</td><td>5 Marks</td></tr><tr><td>Practical Skills</td><td>5 Marks</td></tr><tr><td>Model Exam</td><td>10 marks</td></tr></table>	Observation Record Note	5 Marks	Practical Skills	5 Marks	Model Exam	10 marks	EXTERNAL MARK (30 Marks) <table><tr><td>Record Note</td><td>5 Marks</td></tr><tr><td>Set A</td><td>10 Marks</td></tr><tr><td>Set B</td><td>15 marks</td></tr></table>	Record Note	5 Marks	Set A	10 Marks	Set B	15 marks
Observation Record Note	5 Marks													
Practical Skills	5 Marks													
Model Exam	10 marks													
Record Note	5 Marks													
Set A	10 Marks													
Set B	15 marks													

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M
CO2	H	H	S	S	S
CO3	H	S	H	S	S

S- Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
Dr. M. Sakthi	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Duraiaraju	Name: Dr.R.Muthukumaran
M.Malathi	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS204	Title :	Batch :	2017-2020
		Core III: Object Oriented Programming Using C++	Semester:	II
Hrs/Week:	4		Credits:	04

Course Objective

On successful completion of the course the students should understand all the features of C++ and make the students to apply the same for writing programming for solving problem.

Course Outcomes (CO)

K1	CO1	To remember the basic OOPs concepts such as Class, Inheritance, Abstraction, Polymorphism etc.
K2	CO2	To understand how C++ differentiates between object oriented programming and procedural programming and the use of function, operator overloading.
K3	CO3	To implement programs using more advanced features such as composition of Objects, Operator overloads, Inheritance, Polymorphism, Dynamic memory allocation etc.
K4	CO4	To evaluate C++ programs using File I/O, Command line Arguments and Exception Handling.

Syllabus

Units	Contents	Hrs
Unit I	Introduction: Evolutions of C++- Object oriented Technology- Programming Paradigms- Disadvantages of Conventional Programs- Key concepts of object oriented programming- Advantages of OOPs- Applications of oops -Input and Output in C++:Streams in C++- Predefined Streams – Stream Classes- Formatted and Unformatted data - Formatted Console I/O Operations – Unformatted Console I/O operations- Bit Fields – Manipulators.	8
Unit II	C++ Declarations: Parts of C++ programs – <i>Types of Tokens, Keywords, Identifiers</i> . Data Types: Basic, Derived, User defined, Void – Operators in C++ - Constants- Memory Management Operators- Precedence of Operators in C++. Control Structures: Decision making statements: if- else, nested if – else, goto, break, continue, Switch Case- For loop- While Loop- do while loop. Functions in C++: Parts of a function- passing arguments- Inline Function- Function overloading.	9
Unit III	Classes and Objects: Classes in C++ - Declaring Objects: Public, Private, Protected-Defining Member functions – Characteristics of Member Functions – Rules for Inline Functions- Array of Objects- Friend functions- Constant Member function- Data Hiding- overloading member function. Arrays: <i>Characteristics of arrays- Initialization of Array using functions</i> - Array of Classes . Constructors and Destructors: Characteristics of Constructors and Destructors-Application with constructors- Overloading and Copy Constructors.	10
Unit IV	Operator Overloading and Type Conversion: Keyword Operator – Overloading Unary Operators- Operator Return Type- Constraint on Increment and Decrement Operators- Overloading with friend functions- Type Conversion- Rules for Overloading Operators. Inheritance: Introduction –types of Inheritance: Single, Multi-level, Multiple, Hierarchical, Multi-Path Advantages and its Disadvantages. Polymorphism: Introduction- Pointer to derived Class Objects- Virtual Functions- Rules- Pure Virtual functions.	11

Unit V	Files: File Stream Classes- Steps of File Operation – Finding End of File- File Opening Modes- Manipulators with Arguments – Sequential Read and Write Operations – Binary and ASCII Files- Command Line Arguments. Exception Handling- Principles of Exception Handling- Try, Throw, Catch- Exception Handling Mechanism- Commonly used header Files. Templates: Class Templates-Function Templates	12
	Total Contact Hrs	50
	* <i>Italicized</i> texts are for self study	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1. E. Balagurusamy, “Object Oriented Programming with C++”, Tata McGraw Hill publication, Fifth edition, 2012. 2. Ashok N. Kamthane, “Object Oriented Programming with ANSI and Turbo C++”, Pearson Education 5th Impression 2008.	
REFERENCES	1. D.Ravichandran.J, “Programming with C++”, Tata McGraw Hill publication, fourteenth edition, 2001. 2. RabortLafore, “Object Oriented Programming with C++”, Galgotia Publication Pvt. Ltd, second edition, 2001. 3. Ashok Kamathane- “Programming in C++” Prentice Hall 2003	

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	S	H	S
CO4	H	S	H	S	H

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
Dr.Antony Selvadoss Thanamani	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Durairaju	Name: Dr.R.Muthukumaran
S.S.Shanthi	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS205	Title:	Batch :	2017-2020
		Core IV: Data and File Structure	Semester:	II
Hrs/Week:	4		Credits:	04

Course Objective

On successful completion of the course the students are able to understand the concepts of array, stack, queue, list, linked list, tree, graph theory, searching and sorting.

Course Outcomes (CO)

K1	CO1	To keep in mind the basic static and dynamic data structures and relevant standard algorithms for them.
K2	CO2	To get the idea about advantages and disadvantages of specific algorithms and data structures.
K3	CO3	To implement new solutions for programming problems or improve existing code using learned algorithms and data structures.
K4	CO4	To evaluate algorithms and data structures in terms of time and memory complexity of basic operations.

Syllabus

Units	Contents	Hrs
Unit I	Introduction – Creation of Programs – Analysis of programs – Arrays – representation of Arrays – Ordered Lists – Polynomials – Stacks and Queues – fundamentals – Evaluation of Expressions – Multiple stacks and queues.	9
Unit II	Linked List – Singly Linked lists – Linked Stacks and Queues – Polynomial addition using stack – Functions of Linked list – <i>Doubly Linked List</i> – Dynamic Storage Management – Garbage collection and Compaction.	10
Unit III	Trees – Basics – Binary Trees – Binary Trees Representation – Binary Trees Traversal – Binary tree representation of Trees .Symbol Tables –Hash table.	11
Unit IV	Searching and Sorting – Linear search, Binary search & Fibonacci search – Sorting – Insertion, Quick, Merge (2-way), Heap, and Radix.	11
Unit V	Files: Files, Queries and Sequential Organizations: <i>Storage device types</i> -Query types, Mode of Retrieval, Mode of update– Indexing techniques: Cylinder-Surface Indexing-Hashed Indexes – File Organizations :Sequential Organizations-Random Organizations-Linked Organization-Storage Management.	9
	Total Contact Hrs	50
	<i>*Italicized texts are for self study</i>	
	Power point Presentations, Seminar, and Assignment	
TEXT BOOKS	1. Ellis Horowitz & Sartaz Sahani, “Fundamentals of Data Structures” Galgotia Book Source, 1999. 2. ISRD GROUP, “Data Structures using C” , Tata McGraw Hill ,Seventh Reprint,2010	

REFERENCES	1. Jean Paul Tremblay and Paul G. Sorenson, “An Introduction to Data Structures with Applications” Tata McGraw Hill Publication, Second Edition, 2008. 2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, “Fundamentals of Data Structures in C”, Universities Press (India) Private Limited, 2008. 3. R.Krishnamurthy and G. IndiraniKumaravel, “Data Structures using C”, Tata McGraw – Hill Publishing Company Limited, New Delhi, 2008.
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Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	M
CO2	H	M	H	S	H
CO3	M	H	S	H	S
CO4	M	S	M	S	H

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
R. Deepa	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Durairaju	Name: Dr.R.Muthukumaran
N. Arul Kumar	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS2A2	Title :	Batch :	2017-2020
		Allied-2: Mathematics-II (Discrete Mathematics)	Semester:	II
Hrs/Week:	4		Credits:	04

Course Objective

On successful completion of the course the students are able to understand the concepts and principles of relations, functions, fuzzy sets, partial ordering, algebraic structures, mathematical logic, and formal languages and graph theory.

Course Outcomes (CO)

K1	CO1	To keep in mind about the fundamental ideas and notation of discrete mathematics with examples
K2	CO2	To get the idea of relations and its types and fuzzy sets and its operations
K3	CO3	To analyze the formal language such as formation of words with examples ,groups and monoids
K4	CO4	To Understand some basic properties of graphs and types of graphs, and be able to relate these to practical examples

Syllabus

Units	Contents	Hrs
Unit I	Mathematical logic: Connectives – Tautology and contradiction-Equivalence of Propositions-Duality law- Normal forms – Disjunctive and conjunctive normal Forms-PDNF-PCNF– Worked examples-Predicate calculus – Quantifiers – Free and bound variables(Definitions only).	10
Unit II	Relations: Types of relations-some operation of relation- Composition of Relations – Properties of relation-Equivalence Classes-matrix representation of a relation-Worked Examples. Fuzzy Sets: Fuzzy sets – Crisp Sets –Overview of operations on fuzzy sets – Fuzzy complement – Fuzzy union – Fuzzy intersection – Aggregation operations.	9
Unit III	Functions: Representation of function- <i>Types of function</i> - Composition of functions – Inverse of functions-Worked Examples. Partial ordering: Hasse diagrams for partial ordering-terminology related to posets-Lattice- Properties of Lattices Worked Examples.	10
Unit IV	Algebraic Structure: Semigroups & monoids- Homomorphism of semigroups and monoids- sub semigroups and submonoids-groups Formal languages: Basic definitions-phase structure grammar- types of phase structure grammar- Worked examples	10
Unit V	Graph Theory: Graph –Degree of the vertex – some special simple graphs- <i>Matrix representation of graphs</i> -Paths, Cycles and connectivity- Eulerian Graphs - Hamiltonian graphs- Connectedness in directed graphs- Shortest path algorithm-Dijkstra’s Algorithm-Worked Examples.	11
	Total Contact Hrs	50
	<i>*Italicized texts are for self study</i>	
	Power point Presentations, Seminar, and Assignment	

TEXT BOOKS	1. T.Veerarajan, “Discrete mathematics”, Tata McGraw Hill, 2007. 2. George Klir & Tina A Folger, “Fuzzy Sets, Uncertainty & Information”, Prentice hall of India, Eighth Edition, 2003. 3. Narasingh Deo, “Graph theory with applications to Engineering and computer science”, Prentice hall, 2008
REFERENCES	1. V. Sundaresan, K.S. Ganapathi Subramanian, K. Ganesan, “Discrete Mathematics”, A.P.Publications, Sirkali, 2006. 2. Rani Sironmani, “Formal Languages”, The Christian Literature Society, First Edition, 1984. 3. J.P. Tremplay & R. Manohar “Discrete Mathematical structures with Applications to computer Science”, McGraw Hill Publication 1975. Narasing Deo, “Graph Theory”, Prentice hall of India, New Delhi, 2008.

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	S	H
CO3	M	S	S	M	M
CO4	M	H	H	L	H

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
M. Malathi	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Duraiaraju	Name: Dr.R.Muthukumaran
S. Vallinayagam	Signature:	Signature:	Signature:

Programme code:	B.Sc	Programme Title :	Bachelor of Science (Computer Science)	
Course Code:	17UCS206	Title :	Batch :	2017-2020
		Core Lab II : Programming Lab in C++	Semester:	II
Hrs/Week:	4		Credits:	02

Course Objective

The prime purpose of C++ programming was to add object orientation to the C programming language and also to enhance problem solving and programming skills using OOPs concepts in various domains.

Course Outcomes (CO)

K3	CO1	To apply the basic concepts of C++ such as function, friend functions and array of objects to solve a particular problem.
K4	CO2	To analyze programs using more advanced OOPs concepts such as Constructor/Destructor, Operator overloading, Inheritance, and Polymorphism.
K5	CO3	To validate programs using Dynamic memory allocation and Virtual functions.

Syllabus

Units	Contents	Hrs
	SET A • Program to print Floyd's triangle. • Program to illustrate the concept of class and object. • Program to illustrate the concept of function without return statement. • Program to illustrate the concept of function with return statement. • Program to illustrate the concept of Inline function. • Program to illustrate the concept of Default argument. • Program to illustrate the concept of Friend function. • Program to illustrate the concept of function overloading. • Program to illustrate the concept Array of Object. • Program to illustrate the concept of objects as Function argument. • Program to illustrate the concept of returning by objects. • Program to illustrate the concept of constructors. • Program to illustrate formatting with manipulators. SET B • Program to illustrate the concept of destructors. • Program to illustrate the concept copy constructor. • Program to illustrate the concept overloading unary operators. • Program to illustrate the concept overloading binary operators.	

	• Program to illustrate the concept of single inheritance. • Program to illustrate the concept of multiple inheritances. • Program to illustrate the concept pointers to objects • Program to illustrate the concept pointers to derived objects. • Program to illustrate the concept virtual function. • Program to illustrate formatted console I/O operations. • Program to illustrate working with single file. • Program to illustrate working with multiple files													
INTERNAL MARK (20 Marks)		EXTERNAL MARK (30 Marks)												
<table border="1"><tr><td>Observation Record Note</td><td>5 Marks</td></tr><tr><td>Practical Skills</td><td>5 Marks</td></tr><tr><td>Model Exam</td><td>10 marks</td></tr></table>	Observation Record Note	5 Marks	Practical Skills	5 Marks	Model Exam	10 marks		<table border="1"><tr><td>Record Note</td><td>5 Marks</td></tr><tr><td>Set A</td><td>10 Marks</td></tr><tr><td>Set B</td><td>15 marks</td></tr></table>	Record Note	5 Marks	Set A	10 Marks	Set B	15 marks
Observation Record Note	5 Marks													
Practical Skills	5 Marks													
Model Exam	10 marks													
Record Note	5 Marks													
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Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	H
CO2	H	M	M	S	S
CO3	M	M	H	H	M

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name with Signature	CDC	COE
Dr.Antony Selvadoss Thanamani	Name: Dr.Antony Selvadoss Thanamani	Name: Dr.M.Durairaju	Name: Dr.R.Muthukumaran
S.S.Shanthi	Signature:	Signature:	Signature: