

K.S.RANGASAMY COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

TIRUCHENGODE – 637 215.

DEPARTMENT OF COMPUTER SCIENCE

REVISED COURSES:

Semester -I :

- a. Core I: Problem solving Techniques and C Programming
- b. Core II: Information Technology
- c. Core Practical I: Programming in C

Semester -II:

- a. Core Practical III: Programming in C++

Semester-III:

- a. Core V: Programming in Java
- b. Core Practical IV: Programming in Java

Semester-IV:

- a. Core VIII: Relational Database Management System
- b. Core Practical –V: Programming in .Net

Semester-V:

- a. Core X: Software Engineering
- b. Elective- I: Computer Graphics
- c. Core practical- VII: Computer Hardware

Enclosures:

- i. Copy of Scheme of Examination
- ii. Syllabus copy of the elective course
- iii. Mapping of the courses.



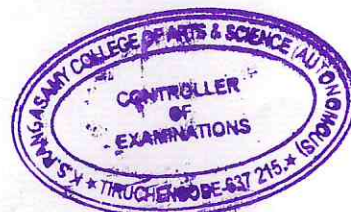
HoD – B.Sc [CS]

HEAD,
Department of Computer Science,
K.S. Rangasamy College of Arts and
Science (Autonomous),
TIRUCHENGODE-637 215.



PRINCIPAL

K. S. Rangasamy College of Arts & Science
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TIRUCHENGODE - 637 215
Narasimharajpet, Tamil Nadu, INDIA




CoE


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Tiruchengode - 637 215, Tamilnadu, India

SCHEME OF EXAMINATION

Subject Code	Subject	Hrs. of Instruction	Exam Duration (Hrs)	Max Marks			Credits
				CA	CE	Total	
First Semester							
Part I							
18UTALA101/ 18UHILA101/ 18UFRLA101	Tamil-I/ Hindi-I/ French-I	5	3	25	75	100	3
Part II							
18UENLA101	Foundation English-I	5	3	25	75	100	3
Part III							
18UCSM101	Core I: Problem Solving Techniques and C Programming	5	3	25	75	100	4
18UCSM102	Core II: Information Technology	4	3	25	75	100	2
18UMACSA101	Allied I: Algebra and Calculus	5	3	25	75	100	4
18UCSMP101	Core Practical I: Programming in C	2	3	40	60	100	2
18UCSMP102	Core Practical II: Office Package	2	3	40	60	100	2
Part IV							
18UVE101	Value Education I: Yoga	2	3	25	75	100	2
		30				800	22
Second Semester							
Part I							
18UTALA201/ 18UHILA201/ 18UFRLA201	Tamil-II/ Hindi-II/ French-II	5	3	25	75	100	3
Part II							
18UENLA201	Foundation English-II	5	3	25	75	100	3
Part III							
18UCSM201	Core III: Object Oriented Programming with C++	5	3	25	75	100	4


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18UCSM202	Core IV: Computer Architecture	5	3	25	75	100	4
18UMACSA201	Allied II: Numerical Methods	5	3	25	75	100	4
18UCSMP201	Core Practical III: Programming in C++	3	3	40	60	100	2
Part IV							
18UVE201	Value Education II: Environmental Studies	2	3	25	75	100	2
		30				700	22
Third Semester							
Part I							
18UTALA301/ 18UHILA301/ 18UFRLA301	Tamil-III/ Hindi-III/ French-III	5	3	25	75	100	3
Part II							
18UENLA301	Foundation English-III	5	3	25	75	100	3
Part III							
18UCSM301	Core V: Programming in Java	4	3	25	75	100	4
18UCSM302	Core VI: Data Structures	4	3	25	75	100	4
18UMACSA301/ 18UECCSA301	Allied III: Statistical Methods/Digital Electronics and Microprocessor	4	3	25	75	100	4
18UCSMP301	Core Practical IV: Programming in Java	2	3	40	60	100	2
Part IV							
18UCSSBP301	SBC Practical I: Web Designing using HTML, CSS (Internal Evaluation)	2	3	100	-	100	2
	NMEC I	2	3	25	75	100	2

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B.Sc., Computer Science (Students admitted from 2018-2019 onwards)

Non Credit							
18ULS301	Career Competency Skills I	1	-	-	-	-	-
	Add-On Course I	1	3	40	60	100	-
		30				900	24
Fourth Semester							
Part I							
18UTALA401/ 18UHILA401/ 18UFRLA401	Tamil-IV/ Hindi-IV/ French-IV	5	3	25	75	100	3
Part II							
18UENLA401	Foundation English-IV	5	3	25	75	100	3
Part III							
18UCSM401	Core VII: Programming in .NET(VB.NET & ASP.NET)	4	3	25	75	100	4
18UCSM402	Core VIII: Relational Database Management Systems	4	3	25	75	100	4
18UMACSA401/ 18UECSA401	Allied IV: Operations Research/Internet of Things	4	3	25	75	100	4
18UCSMP401	Core Practical V: Programming in .NET	2	3	40	60	100	2
Part IV							
18UCSSBP401	SBC Practical II: JavaScript(Internal Evaluation)	2	3	100	-	100	2
	NMEC II	2	3	25	75	100	2
Non Credit							
18ULS401	Career Competency Skills II	1	-	-	-	-	-
	Add-On Course II	1	3	40	60	100	-
		30				900	24

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Fifth Semester							
Part III							
18UCSM501	Core IX: Data Mining and Warehousing	6	3	25	75	100	4
18UCSM502	Core X: Software Engineering	5	3	25	75	100	4
18UCSM503	Core XI: Operating Systems	5	3	25	75	100	4
	Elective : I	5	3	25	75	100	3
18UCSMP501	Core Practical VI: R-Programming	3	3	40	60	100	3
18UCSMP502	Core Practical VII: Computer Hardware	3	3	40	60	100	3
Part IV							
18UCSSBP501	SBC Practical III: MySQL (Internal Evaluation)	2	3	40	60	100	2
Part V							
18UCSE501	Extension Activity	-	-	-	-	-	2
Non Credit							
18ULS501	Career Competency Skills III	1	-	-	-	-	-
		30				700	25
Sixth Semester							
Part III							
18UCSM601	Core XII: Python Programming	6	3	25	75	100	4
18UCSM602	Core XIII: Computer Networks [Fifth Unit as Self- study]	6	3	25	75	100	4
	Elective II	6	3	25	75	100	3
18UCSMP601	Core Practical VIII: Python Programming	3	3	40	60	100	3
18UCSMP602	Core Practical IX: Computer Networking	3	3	40	60	100	3
18UCSPR601	Project Work	3	3	40	60	100	4
Part IV							
18UCSSBP601	SBC Practical IV:	2	3	40	60	100	2

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NON MAJOR ELECTIVE COURSE

The department offers the following two subjects as Non Major Elective Course for other than the computer science students for third and fourth semesters.

S.No.	Semester	Subject Code	Subject
1	III	18UCSNM301	Internet Technology
2	IV	18UCSNM401	Principles of Web Design

ELECTIVE I


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

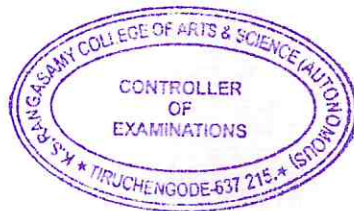
S.No	Subject Code	Subject
1.	18UCSEL501	E-Commerce
2.	18UCSEL502	Computer Graphics

ELECTIVE II

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

S.No	Subject Code	Subject
1.	18UCSEL601	Cloud Computing
2.	18UCSEL602	Mobile Computing


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18UCSM101	CORE I: PROBLEM SOLVING TECHNIQUES AND C PROGRAMMING	SEMESTER - I	
<p>COURSE OBJECTIVES:</p> <p>The Course aims</p> <ul style="list-style-type: none"> • To explore the problem solving concepts. • To acquire the basic knowledge in C programming. • To implement the problem solving techniques using C language. 			
Credits: 4		Total Hours: 50	
UNIT	CONTENTS	Hrs	CO
I	<p>Introduction to Computer Problem-Solving: Introduction - The Problem-solving Aspect - Top-down Design - Implementation of Algorithms - Program Verification - The Efficiency of Algorithms - The Analysis of Algorithms. Fundamental Algorithms: Exchanging the Values of Two Variables-Reversing the Digits of an Integer. Factoring Methods: Finding the Square Root of a Number - Generating Prime Numbers. Array Techniques: Finding the Maximum Number in a Set-Finding the k^{th} Smallest Element.</p>	10	CO1
II	<p>Overview of C: History of C - Importance of C - Sample Programs - Basic Structure of C Programs- Executing a 'C' Program. Constants, Variables, and Data Types: Introduction - Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types -Overflow and Underflow Data. Operators and Expressions: Arithmetic Operators -</p>	10	CO2

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	<p>Relational Operators - Logical Operators - Assignment Operators- Increment and Decrement Operators - Conditional Operator- Bitwise Operators - Special Operators - Arithmetic Expressions - Evaluation of Expressions - Mathematical Functions. Managing Input and Output Operations: Introduction - Reading a Character -Writing a Character - Formatted Input-Formatted Output.</p>		
III	<p>Decision Making and Branching: Decision Making with IF Statement- Simple IF Statement - The IF.....ELSE Statement- Nesting of IF.....ELSE Statements- The ELSE IF Ladder - The Switch Statement - The ?: Operator - The GOTO Statement. Decision Making and Looping: Introduction - The WHILE Statement- The DO Statement- The FOR Statement - Jumps in LOOPS. Arrays: Introduction - One-dimensional Arrays - Declaration of One-dimensional Arrays - Initialization of One-dimensional Arrays - Two-dimensional Arrays - Initializing Two-dimensional Arrays - Multi-Dimensional Arrays.</p>	10	CO3
IV	<p>Character Arrays and Strings: Declaring and Initializing String Variables- Reading Strings from Terminal - Writing Strings to Screen - Arithmetic Operations on Characters -String-handling Functions. User-defined Functions: Elements of User-defined Functions - Definition of Functions - Return Values and their Types - Function Calls -</p>	10	CO4



	Function Declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Arguments with Return Values - No Arguments but Returns a Value - Functions that Return Multiple Values - Recursion - The Scope, Visibility and Lifetime of Variables.		
V	<p>Pointers: Introduction- Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables- Initialization of Pointer Variables- Accessing a Variable through its Pointer - Pointers and Arrays- Pointers and Character Strings-Array of Pointers- Pointers as Function Arguments- Functions Returning Pointers-Pointers to Functions.</p> <p>Structures and Unions: Defining a Structure - Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Array of Structures - Arrays within Structures - Structures within Structures - Unions - Size of Structures - Bit Fields.</p>	10	CO5

TEXT BOOKS:

1.	R.G.Dromey, 2011. How to solve it by Computer. PHI, New Delhi. (Unit I)
2.	Balagurusamy E. 2011. Programming in ANSI C. [Fifth Edition]. Tata McGraw Hill, New Delhi. (Unit II-V)

REFERENCE BOOKS:

1.	Suresh Srivastava.K. 2017. C in Depth. [Third Edition]. BPB Publications, New Delhi.
2.	Yashavant Kanetkar. 2016. Let Us C. [Fifteenth Edition]. BPB Publications,

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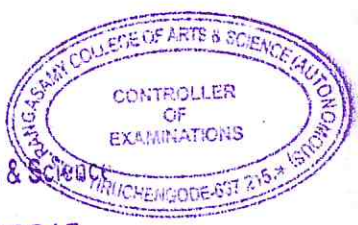
	New Delhi.
3.	Thamarai Selvi S. and Murugesan R. 1999. C for all . [First Edition]. Anuradha Agencies, Kumbakonam.
4.	Jeyapoovan T. 2007. A First Course in Programming with C . [Second Edition]. Vikas Publishing House Pvt. Ltd., New Delhi.
5.	Deitel & Deitel. "C How to Program" . [Eighth Edition]. Prentice Hall.
6.	Byron Gottfried. "Programming in C" . Tata McGraw Hill.
7.	Al Kelley & Ira Pohl. "A Book on C" . [Fourth Edition]. Pearson Education, Asia.
8.	Handout: Problem Solving and C Programming . 2007. Version: PSC/Handout/0307/2.1, Cognizant.
WEB REFERENCES:	
1.	http://www.learn-c.org/
2.	http://www.tutorialspoint.com/cprogramming/
3.	https://www.geeksforgeeks.org/

COURSE OUTCOMES (CO):

After the completion of this course, the students will be able to

CO1	Attain problem solving ability.
CO2	Know the basic terminology of C Programming.
CO3	Develop programs using control structures and arrays.
CO4	Understand the String handling and functions.
CO5	Develop the program using Pointers and Structure concepts.


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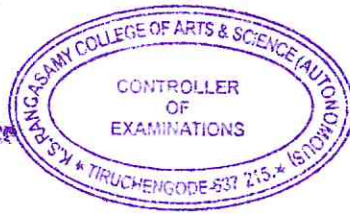
MAPPING:

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	H	H
CO2	M	M	H	H	M
CO3	M	H	H	H	H
CO4	M	M	H	H	H
CO5	M	M	M	M	M

H-High; M-Medium; L-Low

M. Prasad


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18UCSM102	CORE II: INFORMATION TECHNOLOGY	SEMESTER - I	
<p>COURSE OBJECTIVES:</p> <p>The Course aims</p> <ul style="list-style-type: none"> To understand the major components of Computer System and its working principles. To know the role of an Operating System and basic terminologies of networks. To study the usage of Information Technology aids for the Current Scenario. 			
Credits: 2		Total Hours: 40	
UNIT	CONTENTS	Hrs	CO
I	<p>Computer Basics: Introduction - Evolution of Computers- Generations of Computers- Classification of Computers-The Computer System- Applications of Computers. Data and Information: Introduction-Types of Data - Simple Model of a Computer - Data Processing Using a Computer - Desktop Computer. Acquisition of Numbers and Textual Data: Introduction - Input Units - Internal Representation of Numeric Data - Representation of Characters in Computers -Error Detecting Codes.</p>	08	CO1
II	<p>Data Storage: Introduction -Storage Cell - Physical Devices Used as Storage Cells -Random Access Memory - Read Only Memory - Secondary Storage -Compact Disk Read Only Memory (CDROM) - Archival Store. Central Processing Unit: Introduction-The Structure of a Central Processing Unit - Specifications of a CPU - Interconnection of CPU with Memory and I/O Units.</p>	08	CO2

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III	Computer Networks: Introduction - Local Area Network (LAN) - Applications of LAN - Wide Area Network (WAN) - Future of Internet Technology. Output Devices: Introduction - Video Display Devices - Touch Screen Display - E-Ink Display - Printers.	08	CO3
IV	Computer Software: Introduction - Operating System - Programming Languages - Classification of Programming Languages. Data Organization: Introduction - Organizing a Database - Structure of a Database - Database Management System - Example of Database Design.	08	CO4
V	Some Internet Applications: Introduction - Email - The World Wide Web - Information Retrieval from the World Wide Web - Other Facilities Provided by Browsers - Audio on the Internet. Societal Impacts of Information Technology: Careers in Information Technology.	08	CO5
TEXTBOOKS:			
1.	<i>Rajaraman V.</i> 2013. Introduction to Information Technology. [Eleventh Printing]. Prentice Hall of India Pvt. Limited, New Delhi. (UNIT I to V)		
2.	<i>ITL Education Solutions Limited,</i> 2013. Introduction to Information Technology. [Second Edition]. Pearson Education, New Delhi. (UNIT I - Computer Basics Chapter)		
REFERENCE BOOKS:			
1.	<i>Alexis Leon and Mathews Leon.</i> 2009. Fundamentals of Information Technology. [Second Edition]. Leon TechWorld, New Delhi.		

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2.	ITL Educations Solution Limited. 2011. Introduction to Computer Science. Pearson Education, India.
3.	Nagpal, D.P. 2010. Computer Fundamentals. [First Edition, Revised]. S.Chand& Company Ltd, New Delhi.
WEB REFERENCES:	
1	https://www.geeksforgeeks.org
2	http://best-knowledge-of-computer.blogspot.com
3	https://cs.lmu.edu/~ray/notes/inetapps

COURSE OUTCOMES (CO):

After the completion of this course, the students will be able to

CO1	Understand the basic components of a computer system.
CO2	Aware of secondary storage devices and their characteristics.
CO3	Understand the concepts and fundamentals of data communication and computer networks.
CO4	Utilize database management systems to manipulate data for various applications.
CO5	Gain knowledge of Internet technologies and basic web authoring.

MAPPING:

CO \ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	H	H	M	M
CO2	H	M	M	H	H
CO3	M	H	M	H	H
CO4	M	H	M	M	H
CO5	H	H	M	H	H

H-High; M-Medium; L-Low

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18UCSMP101	CORE PRACTICAL I: PROGRAMMING IN C	SEMESTER - I	
COURSE OBJECTIVES:			
The course aims			
<ul style="list-style-type: none"> To acquire the knowledge of C language. To develop basic programming skills. 			
Credits: 2		Total Hours: 30	
S.No.	PROGRAMS	Hrs	CO
1.	Program to find the Simple interest and Compound interest (Operators).	3	CO1
2.	Program to find the greatest among the three numbers(Branching).	3	CO2
3.	Program to find the Fibonacci Series (Looping).	3	CO2
4.	Program to Sort N numbers in an Array.	3	CO3
5.	Program to perform Matrix addition and subtraction (Arrays).	3	CO3
6.	Program to check the given string is a Palindrome(String Handling Functions).	3	CO3
7.	Program to print Employee details using User defined functions.	3	CO4
8.	Program to find Factorial using Recursion.	3	CO4
9.	Program to display the Student Details using Structure	3	CO4
10.	Program to Swap two numbers using Pointers	3	CO5
WEB REFERENCES:			
1.	https://www.cprogramming.com/tutorial/c-tutorial.html		
2.	http://www.learn-c.org/		
3	https://www.geeksforgeeks.org		

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COURSE OUTCOMES (CO):

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

CO1	Develop simple programs.
CO2	Implement various control structures.
CO3	Develop program using Arrays and String Handling concepts.
CO4	Implement Function and Structure concepts.
CO5	Understand Pointer concepts.



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18UCSMP201	CORE PRACTICAL III: PROGRAMMING IN C++	SEMESTER - II	
COURSE OBJECTIVES:			
The subject aims			
1. To implement the various OOPs concepts and features in C++.			
Credits: 2		Total Hours: 30	
S.No	PROGRAMS	Hrs	CO
1.	Program for Classes and Objects using Scope Resolution Operator.	3	CO1
2.	Program to find the roots of an algebraic equation using Bisection method.	3	CO2
3.	Program for Inline and Friend functions.	3	CO3
4.	Program to find area of circle, rectangle and triangle using Function Overloading.	3	CO3
5.	Program using Constructor and Destructor.	3	CO3
6.	Program using Operator Overloading.	3	CO3
7.	Program using Pure Virtual Function.	3	CO3
8.	Program to prepare student mark statement using Multiple Inheritance.	3	CO4
9.	Program to read and write values in a File.	3	CO5
10.	Program using Function Templates.	3	CO5
WEB REFERENCES:			
1.	https://www.jdoodle.com/online-compiler-c++		
2.	https://www.cpp.thiyagaraaj.com/c-programs/c-basic-example-programs		
3.	https://www.programiz.com/cpp-programming/examples		

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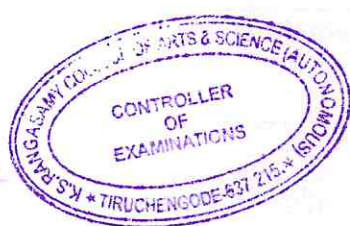
COURSE OUTCOMES (CO):

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

CO1	Implement OOPs concepts.
CO2	Solve numerical method problems.
CO3	Understand the various concepts associated with members functions.
CO4	Explore concepts associated with Inheritance.
CO5	Implement concepts associated with Files and Templates.


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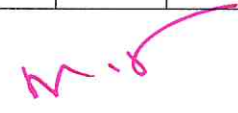


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Tiruchengode - 637 215, Tamilnadu, India.

18UCSM301	CORE V: PROGRAMMING IN JAVA	SEMESTER - III	
COURSE OBJECTIVES: The course aims <ul style="list-style-type: none"> To understand the fundamentals of Object Oriented Programming. To explore the programming skills using Java. 			
Credits: 4		Total Hours:50	
UNIT	CONTENTS	Hrs	CO
I	Java Evolution: Java History - Java Features-How Java differs from C and C++- Java and Internet - Java and World Wide Web- Web Browsers. Overview of Java Language: Simple Java program- Java program Structure- Java Tokens- Java Statements - Java Virtual Machine. Constants, Variables and Data Types: Constants- Variables -Data Types- Declaration of Variables - Giving values to variables- Scope of variables- Symbolic Constants- Type casting- Getting value of variables- Standard and default values.	10	CO1
II	Operators and Expressions: Introduction- Arithmetic Operators- Relational Operators- Logical Operators- Assignment Operators- Increment and Decrement Operators- Conditional Operator- Bitwise Operators- Special Operators- Arithmetic Expressions- Evaluation of Expressions- Precedence of Arithmetic operators- Type conversions in Expressions- Operator Precedence and Associativity -Mathematical functions. Decision Making and Branching: Decision making with if Statement- Simple if Statement - The If..Else statement - Nesting of If..Else Statements - The Else If Ladder- The Switch Statement- The ?: Operator. Decision Making and Looping: The while Statement- The do Statement- The For Statement- Jumps in Loops-Labeled Loops.	10	CO2


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<p>III</p>	<p>Classes, Objects and Methods: Introduction-Defining a Class-Fields Declaration-Methods Declaration-Creating Objects-Accessing Class Members - Constructors-Methods Overloading-Static Members-Nesting of Methods-Inheritance: Extending a Class-Overriding Methods-Final Variables and Methods-Final Classes-Finalizer Methods-Abstract Methods and Classes-Methods with Varargs -Visibility Control. Arrays, Strings and Vectors: Introduction - One-dimensional Arrays-Creating anArray- Two-dimensional Arrays-Strings - Vectors-Wrapper Classes - Enumerated Types. Interfaces: Multiple Inheritance: Introduction-Defining Interfaces-Extending Interfaces-Implementing Interfaces-Accessing Interface Variables. Packages: Putting classes Together: Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package-Hiding Classes-Static Import.</p>	<p>10</p>	<p>CO3</p>
<p>IV</p>	<p>Multithreaded Programming: Introduction-Creating Threads-Extending the Thread Class- Stopping and Blocking a Thread-Life Cycle of a Thread-Using Thread Methods-Thread Exception-Thread Priority-Synchronization-Implementing the 'Runnable' Interface. Managing Errors and Exceptions: Introduction-Types of Errors- Exceptions-Syntax of Exception Handling Code-Multiple Catch Statements-Using Finally Statement-Throwing Our Own Exceptions-Using Exception for Debugging.</p>	<p>10</p>	<p>CO4</p>
	<p>Applet Programming: Introduction -How Applets Differ from Applications-Preparing to Write Applets-Building Applet Code-Applet Life Cycle- Creating an Executable Applet-Designing a Web Page-Applet Tag-Adding Applet to HTML File-Running the</p>		

V	Applet-More About Applet Tag-Passing Parameters to Applets-Aligning the Display-More about HTML Tags-Displaying Numerical Values-Getting Input from the User. Managing Input/Output Files in Java: Introduction- Concepts 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 - Random Access Files.	10	CO5
TEXTBOOK:			
1	Balagurusamy, E. 2008. Programming with Java - A Primer. [Third Edition].Tata McGraw Hill Education Pvt. Limited, New Delhi.		
REFERENCE BOOKS:			
1	Hebert Schildt. 2002. The Complete Reference Java 2. [Tenth Edition]. Tata McGraw Hill Education Pvt. Limited, New Delhi. Paperback edition 2017		
2	S.Horstmann.2019.Core Java,Volume II-Advanced Features[eleveth Edition].Prentice Hall of India Pvt. limited,New Delhi		
3	Debasish Jana. 2005. Java and Object-Oriented Programming Paradigm. [Second Printing]. Prentice Hall of India, New Delhi.		
WEB REFERENCES:			
1.	http://www.javapoint.com/java-tutorial		
2.	http://www.beginnersbook.com/java-tutorial/		
3.	http://tutuorialspoint.com/java		

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COURSE OUTCOMES (CO):

On successful completion of this course, the students will be

CO1	Understand the basic terminology of Java Programming
CO2	Develop programs using control structures
CO3	Able to understand the interfaces and packages
CO4	Understand the multithreaded programming and exceptions
CO5	Develop program using Applets and files

MAPPING:

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	M	L
CO2	M	H	M	H	H
CO3	M	M	M	M	H
CO4	M	M	M	M	H
CO5	M	H	M	H	H

H-High; M-Medium; L-Low

M.V


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18UCSM302	CORE VI:DATA STRUCTURES	SEMESTER - III	
COURSE OBJECTIVES:			
The course aims			
<ol style="list-style-type: none"> 1. To know the fundamental concepts of Data Structures. 2. To develop applications using algorithms. 			
Credits: 4		Total Hours:50	
UNIT	CONTENTS	HRS	CO
I	Introduction to Data Structures: Introduction-Types of Data Structures-Abstract Data Type- Time and Space Complexity-Big-Oh Notation. Arrays: Introduction- Declaration of Arrays- Accessing Array Elements- Storing Values in Arrays- Calculating the Length of an Array -Operations on Arrays -Two-dimensional Arrays-Multi- dimensional Arrays.	10	CO1
II	Linked Lists: Introduction - Linked List Versus Arrays - Memory Allocation and De-Allocation for a Linked List - Singly Linked List- Polynomial Representation- Circular Linked List- Doubly Linked List.	10	CO2
III	Stacks and Queues: Stacks- Array Representation of Stacks- Operations on a Stack- Linked Representation of Stack- Operations on a Linked Stack- Infix, Postfix and Prefix Notation- Evaluation of an Infix Expression- Convert Infix Expression to prefix Expression-Applications of stack. Queues: Array Representation of Queues- Circular Queue- Linked Representation of Queue- Operation on a Queue- Deque - Priority Queues - Multiple Queues.	10	CO3
IV	Trees: Binary Trees-Expression Trees- Traversing of a Binary Tree. Efficient Binary Trees: Binary search Trees- Operations on Binary Search Trees. Graphs: Introduction- Representation of	10	CO4

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	Graphs-Graph traversal Algorithms.		
V	Graphs: Shortest Path Algorithms- Minimum Spanning Tree- Prim’s Algorithm- Kruskal’s Algorithm- Dijkstra’s Algorithm- Applications of Graphs. Sorting and Searching: Introduction- Bubble Sort- Insertion Sort- Selection Sort- Merge Sort- Quick Sort- Heap Sort.	10	CO5
TEXTBOOK:			
1	ReemaThareja.2012. Data Structures Using C. [First Edition]. Oxford University Press, New Delhi.		
REFERENCE BOOKS:			
1	A.K.Sharma. 2011. Data Structures Using C. [Second Edition]. BPB Publications,NewDelhi		
2	Seymour Lipschutz. 2010. Data Structures with C. [First Edition]. McGraw Hill, International Editions, Schaum’s Outline Series, New Delhi.		
3	R.S.Salaria. Data Structures and Algorithms Using C. [Fifth Edition]. Khanna Publishing, New Delhi. Paperback - 2018		
4	G.A.V.Pai. 2008. Data Structures and Algorithms: Concepts, Techniques and Applications. [First Edition]. McGraw Hill, International Editions, New Delhi. Paperback – 1 Jul 2017		
WEB REFERENCES:			
1.	https://www.geeksforgeeks.org/data-structures/		
2.	https://www.edx.org/course/data-structures-fundamentals		
3.	https://www.studytonight.com/data-structures/introduction-to-data-structures		

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COURSE OUTCOMES (CO):

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

CO1	Attain the knowledge of linear and non-linear data structures and analyze the efficiency of the algorithms.
CO2	Handle operations like searching, insertion, deletion, traversing mechanism on linked list.
CO3	Understand the stack and queue with its applications.
CO4	Demonstrate different methods for traversing trees.
CO5	Demonstrate knowledge of various sorting and searching techniques.

MAPPING:

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	M	H
CO2	M	H	H	H	H
CO3	M	H	H	H	H
CO4	M	H	H	H	H
CO5	H	H	H	H	H

H-High; M-Medium; L-Low


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