

**K.S.Rangasamy College of Arts and Science (Autonomous)**

**Tiruchengode – 637 215**

**Department of Computer Applications**

**Courses focus on Employability / Entrepreneurship / Skill Development**

**I. Employability**

- Programming in C
- Programming in C++
- Programming in Java
- Web Application Development
- Accounting Package (Tally)

**II. Entrepreneurship**


- Linux Programming
- Computer Networks Lab
- Mobile Application Development

**III. Skill Development**

- Data Structure using C
- Web Designing using HTML, CSS and JavaScript
- Web Services using Python

Encl.:

1. Copy of Scheme of Examination
2. Syllabus copy of courses highlighting the focus on Employability / Entrepreneurship / Skill Development along with course outcomes
3. Mapping of the courses

  
HoD – Computer Applications  
**Dr. T. S. VENKATESWARAN,**  
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<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>Employability/ Entrepreneurship/ Skill Development</b>	<b>Content</b>
18UCAM102	Core II: Programming in C	Employability	Unit I to V
18UCAMP102	Core Practical II: Programming in C	Employability	Experiments (1 to 12)
18UCAM201	Core III: Object Oriented Programming with C++	Employability	Unit I to V
18UCAMP201	Core Practical III: Scientific Computing using C++	Employability	Experiments (1 to 12)
18UCAM301	Core V: Programming in Java	Employability	Unit I to V
18UCAMP301	Core Practical V: Programming in Java	Employability	Experiments (1 to 12)
18UCCCAAP301	Allied Practical I: Accounting Package	Employability	Unit I to V
18UCASBP301	SBC Practical I: Web Designing Using HTML , CSS and Java Script	Skill Development	Experiments (1 to 12)
18UCAMP402	Core Practical VII: Linux Programming	Entrepreneurship	Experiments (1 to 12)
18UCASBP401	SBC Practical II: Data Structure using C	Skill Development	Experiments (1 to 12)
18UCAM501	Core X: Web Application Development	Employability	Unit I to V
18UCAMP501	Core Practical VIII: Web Application Development	Employability	Experiments (1 to 12)
18UCASBCP501	SBC Practical III: Web Services Using Python	Skill Development	Experiments (1 to 12)
18UCAMP502	Core Practical IX: Computer Networks Lab	Entrepreneurship	Experiments (1 to 12)
18UCASBCP602	SBC Practical IV: Mobile Application Development	Entrepreneurship	Experiments (1 to 12)

  
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**SCHEME OF EXAMINATION**

Course Code	Course	Hrs. of Instruction	Exam Duration (Hrs.)	Max Marks			Credits
				CA	CE	Total	
<b>First Semester</b>							
<b>Part I</b>							
18UTALB101/ 18UHILB101/ 18UFRLB101	Tamil-I/ Hindi-I/ French-I	5	3	25	75	100	3
<b>Part II</b>							
18UENLB101	General English I	5	3	25	75	100	3
<b>Part III</b>							
18UCAM101	Core I : Problem Solving Techniques	4	3	25	75	100	4
18UCAM102	Core II: Programming in C	4	3	25	75	100	4
18UMACAA101	Allied I: Mathematics for Computer Applications	4	3	25	75	100	4
18UCAMP101	Core Practical I: Office Package	3	3	40	60	100	2
18UCAMP102	Core Practical II: Programming in C	3	3	40	60	100	2
<b>Part IV</b>							
18UVE101	Value Education I: Yoga	2	3	25	75	100	2
		30				800	24
<b>Second Semester</b>							
<b>Part I</b>							
18UTALB201/ 18UHILB201/ 18UFRLB201	Tamil-II/ Hindi-II/ French-II	5	3	25	75	100	3
<b>Part II</b>							
18UENLB201	General English II	5	3	25	75	100	3
<b>Part III</b>							
18UCAM201	Core III: Object Oriented Programming with C++	4	3	25	75	100	4
18UCAM202	Core IV: Computer Organization and Architecture	4	3	25	75	100	4
18UMACAA201	Allied II: Scientific Computing Methods	4	3	25	75	100	4

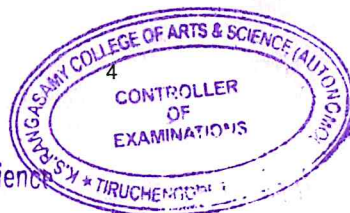


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18UCAMP201	Core Practical III: Scientific Computing using C++	3	3	40	60	100	2
18UCAMP202	Core Practical IV: Designing Tools	3	3	40	60	100	2
<b>Part IV</b>							
18UVE201	Value Education II: Environmental Studies	2	3	25	75	100	2
		<b>30</b>				<b>800</b>	<b>24</b>
<b>Third Semester</b>							
<b>Part III</b>							
18UCAM301	Core V: Programming in Java	4	3	25	75	100	4
18UCAM302	Core VI: Data Structures	5	3	25	75	100	4
18UCAM303	Core VII: Web Designing	4	3	25	75	100	4
18UCCCAA301	Allied III: Principles of Accountancy	4	3	25	75	100	4
18UCAMP301	Core Practical V: Programming in Java	3	3	40	60	100	2
18UCCCAAP301	Allied Practical I: Accounting Package	3	3	40	60	100	2
<b>Part IV</b>							
18UCASBP301	SBC Practical I: Web Designing Using HTML, CSS	2	3	40	60	100	2
18UCSNM301	NMEC I	2	3	25	75	100	2
<b>Non Credit</b>							
18ULS301	Career Competency Skills I	1	-	-	-	-	-
18UCAAC301 / 18UCAAC302	Add-on Course I	2	3	-	100	100	-
		<b>30</b>				<b>900</b>	<b>24</b>
<b>Fourth Semester</b>							
<b>Part III</b>							
18UCAM401	Core VIII: Relational Database Management System	4	3	25	75	100	4
18UCAM402	Core IX: Operating System Concepts	5	3	25	75	100	4


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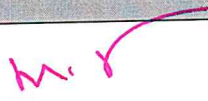
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18UCAEL401/ 18UCAEL402/ 18UCAEL403	Elective I	4	3	25	75	100	3
18UCCCAA401	Allied IV: Cost and Management Accounting	4	3	25	75	100	4
18UCAMP401	Core Practical VI: RDBMS Package	3	3	40	60	100	2
18UCAMP402	Core Practical VII: Linux Programming	3	3	40	60	100	2
<b>Part IV</b>							
18UCASBP401	SBC Practical II: Data Structure using C	2	3	40	60	100	2
18UCSNM401	NMEC II	2	3	25	75	100	2
<b>Non Credit</b>							
18ULS401	Career Competency Skills II	1	-	-	-	-	-
18UCAAC401 / 18UCAAC402	Add-on Course II	2	3	-	100	100	-
		<b>30</b>				<b>900</b>	<b>23</b>
<b>Fifth Semester</b>							
<b>Part III</b>							
18UCAM501	Core X: Web Application Development	5	3	25	75	100	4
18UCAM502	Core XI: Computer Networks	5	3	25	75	100	4
18UCAM503	Core XII: Cloud Computing	5	3	25	75	100	4
18UCAEL501/ 18UCAEL502/ 18UCAEL503/	Elective II	4	3	25	75	100	3
18UCAMP501	Core Practical VIII: Web Application Development	3	3	40	60	100	2
18UCAMP502	Core Practical IX: Computer Networks Lab	3	3	40	60	100	2
<b>Part IV</b>							

  
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18UCASBCP501	SBC Practical III: Web Services Using Python	2	3	40	60	100	2
<b>Part V</b>							
18UCAE501	Extension Activity	-	-	-	-	-	2
<i>Non Credit</i>							
18ULS501	Career Competency Skills III	1	-	-	-	-	-
18UCAPR601	Project & viva-voce	2					
		30				700	23
<b>Sixth Semester</b>							
<b>Part III</b>							
18UCAM601	Core XIII: Big Data Analytics	5	3	25	75	100	4
18UCAM602	Core XIV: Mobile Technology (fifth unit as self study)	5	3	25	75	100	4
18UCAM603	Core XV: E-Commerce	4	3	25	75	100	3
18UCAM604	Core XVI: Internet of Things	5	3	25	75	100	3
18UCAMP601	Core Practical X:R Programming	4	3	40	60	100	2
18UCAPR601	Project & Viva-Voce	4	3	40	60	100	4
<b>Part IV</b>							
18UCASBCP602	SBC Practical IV: Mobile Application Development	2	3	40	60	100	2
<i>Non Credit</i>							
18ULS601	Career Competency Skills IV	1	-	-	-	-	-
		30				700	22
<b>Grand Total</b>						<b>4800</b>	<b>140</b>

- Students have to undergo an Advanced Learner Course during the Second year of their course of study.
- Project hours can be divided into two such as 1. Problem presentation in the Class room 2. Problem implementation in the Lab

  
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**ELECTIVE I**

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

S.No	Subject Code	Subject
1.	18UCAEL401	Principles of information security
2.	18UCAEL402	Client Server technology
3.	18UCAEL403	Software Engineering

**ELECTIVE II**

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

S.No	Subject Code	Subject
1.	18UCAEL501	Social and Business Etiquette
2.	18UCAEL502	Artificial Intelligence
3.	18UCAEL503	Social Media Data Analytics

**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	18UCSN301	Internet Technology
2	IV	18UCSN401	HTML and Web Designing

**ADD-ON COURSE**

S.No	Semester	Subject Code	Subject
1	III	18UCAAC301	Digital Business
2	III	18UCAAC302	Ethics for Digital Era
3	IV	18UCAAC401	Digital Hygiene
4	IV	18UCAAC402	Fundamentals of Multimedia

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## PROJECT DESCRIPTION

- The project work shall be carried out by group of students in the V semester and has to complete the work at the end of VI Semester.
- Upon completion of the project work/dissertation the candidate will be required to appear for a viva-voce conducted by an external examiner.
- The Student has to attend 3 reviews before completing his/her Project.
- All 3 reviews will be reviewed by External Resource Person.
- A candidate failing to secure the prescribed passing minimum in the dissertation shall be required to re-submit the dissertation with the necessary modifications.
- The assessment of students' performance in a semester is calculated by Continuous Internal Assessment (CA.) for 40 marks and External Assessment for 60 marks.

## ADVANCED LEARNERS COURSE

(Student shall study the following Advanced Learner Course during their third semester and complete the course at the end of fourth semester)

S.No	Subject Code	Name of the Course
1	18UCAAL401	Software Testing



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18UCAM102	CORE II: PROGRAMMING IN C	SEMESTER - I	
<p><b>COURSE OBJECTIVES:</b></p> <p>The Course aims</p> <ul style="list-style-type: none"> <li>To acquire basic knowledge in C programming</li> <li>In-depth understanding of functional and logical programming in C</li> <li>To provide exposure to problem-solving through programming</li> </ul>			
Credits : 4		Total Hours: 50	
UNIT	CONTENTS	Hrs	CO
I	<p><b>Overview of C:</b> History of C - Importance of C - Sample Programs - Basic Structure of C Programs-Executing a 'C' Program. <b>Constants, Variables, and Data Types:</b> Introduction - Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables - Declaration of Storage Class - Assigning Values to Variables - Defining Symbolic Constants -Declaring a Variable as Volatile. <b>Operators and Expressions:</b> 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</p>	10	CO1
II	<p><b>Managing Input and Output Operations:</b> Introduction - Reading a Character -Writing a Character - Formatted Input- Formatted Output. <b>Decision Making and Branching:</b> Introduction - 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. <b>Decision Making and Looping:</b> Introduction - The While Statement- The Do Statement- The for Statement - Jumps in Loops.</p>	09	CO2



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III	<b>Arrays:</b> Introduction - One-Dimensional Arrays - Declaration of One-Dimensional Arrays - Initialization of One-Dimensional Arrays - Two-Dimensional Arrays - Initializing Two-dimensional Arrays - Multi-dimensional Arrays- Dynamic Arrays. <b>Character Arrays and Strings:</b> Introduction-Declaring and Initializing String Variables- Reading Strings from Terminal - Writing Strings to Screen - Arithmetic Operations on Characters - Putting Strings Together - Comparison of Two Strings - String-Handling Functions - Table of Strings.	10	CO3
IV	<b>User-defined Functions:</b> Introduction-Need for User-Defined Functions- A Multi-Function Program-Elements of User-Defined Functions - Definition of Functions - Return Values and Their Types - Function Calls - 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 -Nesting of Functions-Recursion - Passing Arrays to Functions-Passing Strings to Functions - The Scope, Visibility and Lifetime of Variables.	10	CO4
V	<b>Structures and Unions:</b> Introduction - Defining a Structure - Declaring Structure Variables - Accessing Structure Members - Structure Initialization -Copying and Comparing Structuring Variables - Operation on Individual Members- Arrays of Structures - Arrays within Structures - Structures within Structures - Structures and Functions - Unions - Size of Structures - Bit Fields. <b>Pointers:</b> Introduction- Understanding Pointers- Accessing the Address of a Variable- Declaring Pointer Variables- Initialization of Pointer Variables- Accessing a Variable Through its Pointer -Chain of Pointers -Pointer Expressions-Pointers Increments and Scale Factor- Pointers and Arrays- Pointers and Character Strings-Array of Pointers- Pointers as Function Arguments- Functions Returning Pointers-Pointers to Functions-Pointers and Structures.	11	CO5
<b>TEXT BOOK(S):</b>			
1	<i>Balagurusamy E.</i> 2017, <b>Programming in ANSI C.</b> [Seventh Edition]. Tata McGraw Hill, New Delhi.		
<b>REFERENCE BOOKS:</b>			
1	<i>Yashavant Kanetkar,</i> 2004. <b>Let Us C.</b> [Fifth Edition]. BPB Publications, New Delhi.		
2	<i>Jeyapooan T.</i> 2007, <b>A First Course in Programming with C.</b> [Second Edition]. Vikas Publishing House Pvt. Ltd., New Delhi.		
3	Deitel & Deitel. 2016, <b>"C How to Program"</b> . [Eighth Edition]. Prentice Hall		
4	Byron Gottfried. 2006, <b>"Programming in C"</b> . [Second Edition]. Tata McGraw Hill		



WEB REFERENCES:	
1	<a href="http://www.learn-c.org/">http://www.learn-c.org/</a>
2	<a href="http://www.tutorialspoint.com/cprogramming/index.htm">http://www.tutorialspoint.com/cprogramming/index.htm</a>
3	<a href="http://www.geeksforgeeks.org">http://www.geeksforgeeks.org</a>

### COURSE OUTCOMES (CO):

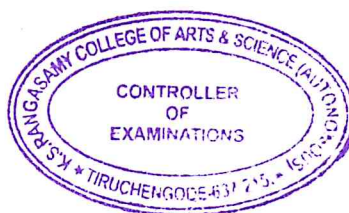
After completion of the course, the students will be able to

CO1	Understand the basic terminology of C Programming
CO2	Recognize Input / Output statements and control structures
CO3	Develop programs using Arrays
CO4	Grasp the concepts of Function and its types
CO5	Develop the program using Structures and Pointers

### MAPPING

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

H-High; M-Medium; L-Low

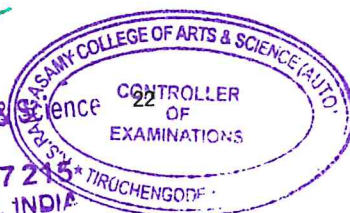


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18UCAMP102	<b>CORE PRACTICAL II: PROGRAMMING IN C</b>	<b>SEMESTER - I</b>	
<b>COURSE OBJECTIVES:</b> The Course aims <ul style="list-style-type: none"> <li>To acquire the knowledge in structured programming language</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 30</b>	
S.No.	PROGRAMS	Hrs	CO
1	Program to implement the formatted Input / Output Functions.	3	CO1
2	Program to illustrate the working of Branching Statements.	3	CO2
3	Program to illustrate the working of Looping Statements.	3	CO2
4	Program to highlight the Relational and Logical Operations.	3	CO3
5	Program to illustrate Array Concepts.	3	CO3
6	Program using String Handling Functions	3	CO3
7	Program using User Defined Function.	3	CO4
8	Program to illustrate the Concept of Recursion.	3	CO4
9	Program to implement the Structure Concept.	3	CO4
10	Program to implement Unions	3	CO5
11	Program to illustrate Pointer Concept.	3	CO5
12	Program using Pointers and Structures.	3	CO5
<b>WEB REFERENCES:</b>			
1.	<a href="https://www.cprogramming.com/tutorial/c-tutorial.html">https://www.cprogramming.com/tutorial/c-tutorial.html</a>		
2.	<a href="https://www.learn-c.org/">https://www.learn-c.org/</a>		
3.	<a href="https://www.geeksforgeeks.org">https://www.geeksforgeeks.org</a>		

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**COURSE OUTCOMES (CO):**

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

CO1	Implement various input and output functions
CO2	Develop program using control structures
CO3	Develop program using Arrays and String Handling concepts
CO4	Execute Function concepts
CO5	Implement Structure and Pointer concepts

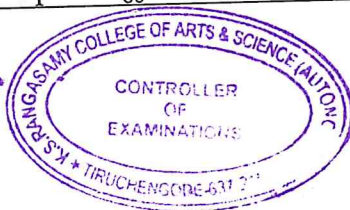


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<b>18UCAM201</b>	<b>CORE III: OBJECT ORIENTED PROGRAMMING WITH C++</b>	<b>SEMESTER - II</b>	
<b>COURSE OBJECTIVES:</b> The Course aims <ul style="list-style-type: none"> <li>• The improvements in C++ over C</li> <li>• The Object Oriented Features in C++</li> <li>• File Handling and Templates</li> </ul>			
<b>Credits : 4</b>			<b>Total Hours: 50</b>
<b>UNIT</b>	<b>CONTENTS</b>	<b>Hrs</b>	<b>CO</b>
I	<b>Principles of Object-Oriented Programming:</b> A look at Procedure-Oriented programming -Object Oriented Programming paradigm - Basic concepts of Object Oriented Programming - Benefits of Object Oriented Programming- Object Oriented Languages- Applications of OOP. <b>Beginning with C++:</b> What is C++? - More C++statements - structure of C++ program. <b>Tokens, Expressions and Control Structures:</b> Introduction - Tokens - Keywords - Identifiers and Constants -Basic Data Types - User Defined Data Types - Storage classes -Derived Data Types - Symbolic Constants - Operators in C++ - Scope Resolution Operator - Member Dereferencing Operators-Memory Management Operators - Manipulators - Expressions and their Types - Operator Overloading - Operator Precedence-Control Structures.	10	CO1
II	<b>Functions in C++:</b> Introduction - The Main Function-Function Prototyping- Call by Reference- Return by Reference - Inline functions- default Arguments- Const Arguments- Function Overloading- Friend and Virtual Functions. <b>Classes and Objects:</b> Introduction - Specifying a class-Defining Member functions- Making an Outside Function Inline - Nesting of member functions - Private Member Functions -Memory Allocation for Objects - Static Data Members - Static Member Functions - Arrays of Objects - Friendly functions - Const member functions.	10	CO2
III	<b>Constructors and Destructors:</b> Introduction- Constructors-Parameterized Constructor - Multiple constructors in a class- Constructor withDefault Arguments - Dynamic initialization of objects - Copy Constructor - Dynamic Constructors-Destructors. <b>Operator overloading and Type Conversions:</b> Introduction- Defining operator overloading - Overloading Unary Operators - Overloading Binary	10	CO3

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	Operators – Rules for Overloading Operators.		
IV	<b>Inheritance: Extending Classes:</b> Introduction – Defining Derived classes - Single inheritance - Making a private member inheritable – Multilevel Inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance – Virtual base classes – Abstract classes – Member classes: Nesting of classes. <b>Pointers, Virtual Functions and Polymorphism:</b> Introduction –Pointers - Pointers to objects - Virtual Functions - Pure Virtual Functions.	10	CO4
V	<b>Managing console I/O operations:</b> Introduction – C++streams – C++Stream classes – Unformatted I/O operations – Formatted console I/O operations – Managing output with manipulators. <b>Working with Files:</b> Introduction - classes for file stream operations – Opening and Closing a file – Detecting end of file – More about Open(): File modes - File Pointers and their Manipulations – Sequential input and output operations – Updating a File: Random Access - Error Handling During File Operations - Command line arguments. <b>Templates:</b> Introduction - Class Templates - Class Templates with Multiple Parameters – Function Templates - Function Templates with Multiple Parameters.	10	CO5

**TEXT BOOK(S):**

1	Balagurusamy, E. 2013, <b>Object Oriented Programming with C++</b> , [Sixth Edition], McGraw Hill Education (India) Private Limited, New Delhi.
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**REFERENCE BOOKS**

1	Robert Lafore. 1994, <b>Object Oriented Programming in C++</b> , [Third Edition], Galgotia Publications Pvt. Limited, New Delhi.
2	Ashok Kamthane, N. 2008, <b>Object Oriented Programming with ANSI &amp; Turbo C++</b> , [Fourth Impression], Pearson Education, India.

**WEB REFERENCES:**

1	<a href="https://www.tutorialspoint.com/cplusplus/">https://www.tutorialspoint.com/cplusplus/</a>
2	<a href="https://www.cplusplus.com/doc/tutorial/">https://www.cplusplus.com/doc/tutorial/</a>
3	<a href="https://www.javatpoint.com/cpp-tutorial">https://www.javatpoint.com/cpp-tutorial</a>

**COURSE OUTCOMES (CO):**

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

CO1	Understand the difference between Procedure-oriented and Object-Oriented Programming
CO2	Create classes and objects with different types of functions
CO3	Use Constructor and Destructor functions in a proper way
CO4	Approach a program logically using Inheritance and Polymorphism
CO5	Understand I/O Streams, File Pointer concepts and Templates

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**MAPPING:**

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

H-High; M-Medium; L-Low



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18UCAMP201		CORE PRACTICAL III: SCIENTIFIC COMPUTING USING C++		SEMESTER - II	
<b>COURSE OBJECTIVES:</b> The Course aims <ul style="list-style-type: none"> <li>To implement various OOPs concepts and features in C++</li> </ul>					
Credits: 2				Total Hours: 30	
S.No.	PROGRAMS	Hrs	CO		
1	Program to find the Transpose of a Matrix	3	CO1		
2	Program to add two matrices	3	CO2		
3	Program to calculate Permutation and Combination	3	CO2		
4	Program to Print Permutations of given character string	3	CO3		
5	Program to find the length of longest common substring.	3	CO3		
6	Program to Generate all possible combinations out of the given characters	3	CO3		
7	a. Program to find Cubic values using Inline function b. Program to find Mean of two numbers using Friend function	3	CO4		
8	Program to find whether a number is Prime using Parameterized Constructor	3	CO4		
9	Program to find the Area Circle, Rectangle and Triangle using Function Overloading	3	CO4		
10	Program to add two complex numbers using Operator Overloading	3	CO5		
11	Program to manage student details(along with sports marks/grade) with Multiple Inheritance	3	CO5		
12	Program to read content from a file and write the upper case equivalent in another file	3	CO5		
<b>WEB REFERENCES:</b>					
1.	<a href="https://www.jdoodle.com/online-compiler-c++">https://www.jdoodle.com/online-compiler-c++</a>				
2.	<a href="https://www.cpp.thiyagaraaj.com/c-programs/c-basic-example-programs">https://www.cpp.thiyagaraaj.com/c-programs/c-basic-example-programs</a>				
3	<a href="https://www.programiz.com/cpp-programming/examples">https://www.programiz.com/cpp-programming/examples</a>				

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**COURSE OUTCOMES (CO):**

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

CO1	The student could implement Matrix, Permutation and Combination concepts in C++
CO2	The student could implement various concepts associated with functions
CO3	The student could implement concepts associated with polymorphism
CO4	The student could implement concepts associated with Inheritance
CO5	The student could implement concepts associated with Files



  
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18UCAM301	CORE V: PROGRAMMING IN JAVA	SEMESTER - III	
<b>COURSE OBJECTIVES:</b> The Course aims <ul style="list-style-type: none"> <li>• Knowing about a General-purpose and Purely object-oriented programming language including data types, control statements, and classes</li> <li>• Secured, well-suited for internet programming using applets and GUI-based</li> </ul>			
Credits : 4		Total Hours: 50	
UNIT	CONTENTS	Hrs	CO
I	<b>Declarations and Access Control:</b> Identifiers and Keywords: Oracle's Java Code Conventions. Define Classes: Import Statements and the Java API - Static Import Statements. Use Interfaces: Declaring an Interface - Declaring Interface Constants. Declare Class Members: Access Modifiers - Nonaccess Member Modifiers - Constructor Declarations - Variable Declarations. Declare and Use enums: Declaring enums. <b>Object Orientation:</b> Encapsulation - Inheritance and Polymorphism - Polymorphism - Overriding / Overloading: Overridden Methods - Overloaded Methods.	10	CO1
II	<b>Object Orientation:</b> Casting - Implementing an Interface - Legal Return Types: Return Type Declarations - Returning a Value. Constructors and Instantiation: Overloaded Constructors - Initialization Blocks. Statics: Static Variables and Methods. <b>Assignments:</b> Stack and Heap - Literals, Assignments, and Variables: Literal Values for All Primitive Types. Scope - Variable Initialization - Passing Variables into Methods: Passing Object Reference Variables - Passing Primitive Variables. Garbage Collection. <b>Operators:</b> Java Operators - Assignment Operators - Relational Operators - instance of Comparison - Arithmetic Operators - Conditional Operator - Logical Operators.	10	CO2
III	<b>Working with Strings, Arrays, and Array Lists:</b> Using String and StringBuilder: The String Class - The StringBuilder Class - Important Methods in the StringBuilder Class. Using Arrays: Declaring an Array - Constructing an Array - Initializing an Array. Using ArrayList: ArrayList Methods in Action - Important Methods in the ArrayList Class. <b>Flow Control and Exceptions:</b> Using if and switch Statements - Creating Loops Constructs - Handling Exceptions - Catching an Exception Using try and catch - Using finally. <b>String Processing, Data Formatting Resource Bundles:</b> String, StringBuilder, and StringBuffer - Dates, Numbers, Currencies, and Locales.	10	CO3

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IV	<p><b>I/O and NIO:</b> File Navigation and I/O: Creating Files Using the File Class - Using FileWriter and FileReader. File and Directory Attributes - DirectoryStream - Serialization. <b>Generics and Collections:</b> toString(), hashCode(), and equals(): The toString() Method - Generic Types - Generic Methods - Generic Declarations. <b>Inner Classes:</b> Method - Local Inner Classes - Static Nested Classes - <b>Threads:</b> Defining, Instantiating, and Starting Threads - Thread States and Transitions - Synchronizing Code, Thread Problems - Thread Interaction. <b>Concurrency:</b> Concurrency with the java.util.concurrent Package - Apply Atomic Variables and Locks - Use java.util.concurrent Collections - Use Executors and ThreadPools.</p>	10	CO4
V	<p><b>Applets:</b> Applet fundamentals - Applet class - Applet life cycle - Steps for developing an applet program - Passing values through parameters - Graphics in an applet - Event-handling. <b>GUI Applications - Part 1:</b> Graphical user interface - Creating windows - Dialog boxes - Layout managers - AWT component classes - Swing component classes. <b>GUI Applications - Part 2:</b> Event handling - Other AWT components - AWT graphics classes - Other swing controls.</p>	10	CO5

**TEXT BOOK(S):**

1	Kathy Sierra, Bert Bates " OCA/OCP Java SE 7 Programmer I & II Study Guide", Oracle Press.(Unit I,II,III,IV)
2	Sagayaraj, Denis, Karthik and Gajalakshmi, 2018, Java Programming - For Core and Advanced Learners, University Press (India) Private Limited, Hyderabad.(Unit V)

**REFERENCE BOOKS:**

1	Hebert Schild, 2002, The Complete Reference Java2, [Fifth Edition]. Tata McGraw-Hill, New Delhi.
2	John Hubbard, R.2004. Programming with Java. [Second Edition]. Tata McGraw-Hill, New Delhi.
3	Debasish Jana. 2005. Java and Object-Oriented Programming Paradigm, [Second Printing]. Prentice-Hall of India, New Delhi.



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**COURSE OUTCOMES (CO):**

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

CO1	Understand the OOPs concept and access controls
CO2	Understand the concept and working with of operators and variables
CO3	Have the rich experience of flow controls, arrays and strings
CO4	Realize the method for learning files and threads.
CO5	Have the knowledge about Applet programming, AWT and GUI applications

**MAPPING:**

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

H-High; M-Medium; L-Low



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18UCAMP301	CORE PRACTICAL V: PROGRAMMING IN JAVA	SEMESTER - III	
<b>OBJECTIVES:</b>			
The Course aims			
<ul style="list-style-type: none"> <li>To understand the implementation of pure Object Oriented Programming language.</li> <li>To create classes and user defined packages.</li> <li>To enrich the knowledge in files, applet and graphics based programming.</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 30</b>	
S.No.	PROGRAMS	Hrs	CO
1	Program using Control statements (IF and Looping Statements).	3	CO1
2	Program using Array.	3	CO2
3	Program using Command Line arguments.	3	CO2
4	Program using Class and Object.	3	CO3
5	Program using Inheritance and Overriding.	3	CO3
6	Program for creating User Defined Package.	3	CO3
7	Program using Interface concept.	3	CO4
8	Program for Exception Handling.	3	CO4
9	Program for Multithreading.	3	CO4
10	Program using Applet.	3	CO5
11	Program Using Graphics Methods.	3	CO5
12	Program using Files.	3	CO5
<b>WEB REFERENCES:</b>			
1.	<a href="https://www.javatpoint.com">https://www.javatpoint.com</a>		
2.	<a href="https://www.w3schools.in">https://www.w3schools.in</a>		
3	<a href="https://www.ibm.com">https://www.ibm.com</a>		

  
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**COURSE OUTCOMES (CO):**

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

CO1	To understand the control, looping statements and array programming
CO2	To implement pure object oriented class creation.
CO3	Able to create package and interface to implement through program.
CO4	Able to handle the errors and create multithreaded programming.
CO5	To create file and applet programming.




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18UCAMP501	CORE PRACTICAL VIII: WEB APPLICATION DEVELOPMENT	SEMESTER-V	
<b>COURSE OBJECTIVES:</b> The course aims <ul style="list-style-type: none"> <li>• The creation of Windows and Console Application using C#.NET</li> <li>• The development of Web Applications using C#.NET and ASP.NET</li> <li>• The development of Database applications using ADO.NET</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 36</b>	
S No	PROGRAMS	Hrs	CO
<b>C#.NET</b>			
1	Creating a Windows/Console Application for handling at least two exceptions	3	CO1
2	Creating a Windows Application to read / write Text and Binary Files.	3	CO1
3	Creating a Windows Application to implement the Auto-Completion feature (for text box).	3	CO1
<b>ASP.NET</b>			
4	Performing the following validations in a Web Page using ASP.NET (Compare Validator , Custom Validator, Range Validator)	3	CO2
5	Performing the following validations in a Web Page using ASP.NET (RegularExpression Validator, Required Field Validator, Validation summary)	3	CO2
6	Creating an application to demonstrate the use of Cookies in ASP.NET.	3	CO3
7	Creating an application to demonstrate the use of Sessions in ASP.NET (Login process).	3	CO3

  
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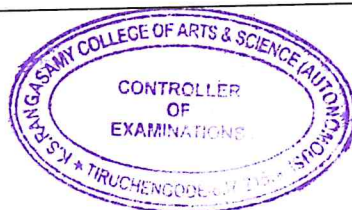
  
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8	Creating an application to demonstrate ADRotatorinASP.NET.	3	CO3
9	Creating an ASP.NET application to display the content of SQLServer database table in Datagrid.	3	CO4
10	Creating an ASP.NET application to Insert, Delete and Update records of SQLServer Database table.	3	CO4
11	Creating an ASP.NET application to demonstrate the search process.	3	CO4
12	Creating an ASP.NET application to create Reports from the available database with (multiple) tables.	3	CO5

**COURSE OUTCOMES (CO):**

On Successful Completion of this Course, the Student can	
CO1	Develop Windows/Console Applications
CO2	Understand the use of Validators
CO3	Understand the use of Cookies, Sessions and AdRotators
CO4	Create Database Applications using ADO.NET
CO5	Prepare reports from the data in Database

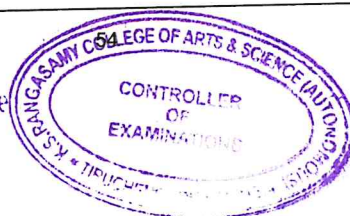


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18UCCCAAP301	ALLIED PRACTICAL I: ACCOUNTING PACKAGE	SEMESTER - III	
<b>OBJECTIVES:</b>			
The Course aims			
<ul style="list-style-type: none"> <li>To understand the implementation of pure Object Oriented Programming language.</li> <li>To create classes and user defined packages.</li> <li>To enrich the knowledge in files, applet and graphics based programming.</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 30</b>	
S.No.	PROGRAMS	Hrs	CO
1	Company creation in Tally, Saving the company profile, Alteration / deletion of company.	3	CO1
2	Creation, Alteration / Deletion of Groups and Ledger accounts.	3	CO2
3	Feeding of Stock Value and opening balances of Assets and Liabilities.	3	CO2
4	Preparation of Contra and Journal vouchers	3	CO3
5	Preparation of Cash Receipt and payment vouchers	3	CO3
6	Preparation of Purchases and Sales vouchers	3	CO3
7	Preparation of Debit Note and Credit Note	3	CO4
8	Voucher Modification, Voucher alteration, deletion and cancellation	3	CO4
9	Displaying voucher list, Daybook, Ledger and Extracting Daybook Summaries	3	CO4
10	Extracting detailed Trial Balance	3	CO5
11	Extracting Profit and Loss Account: Detailed form and Vertical Form	3	CO5
12	Extracting Balance Sheet: Primary Balance Sheet and Detailed Balance Sheet	3	CO5
<b>WEB REFERENCES:</b>			
1.	<a href="https://www.javatpoint.com">https://www.javatpoint.com</a>		
2.	<a href="https://www.w3schools.in">https://www.w3schools.in</a>		
3	<a href="https://www.ibm.com">https://www.ibm.com</a>		

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**COURSE OUTCOMES (CO):**

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

CO1	Understand the basic accounting concepts, conventions and prepare the journal, ledger, subsidiary books and trial balance.
CO2	Prepare the final accounts of sole trader with adjustments.
CO3	Calculate the Average due date and Account Current
CO4	Prepare bank reconciliation statement
CO5	Prepare asset account and depreciation accounts under straight line and written down value methods.



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18UCAMP402		CORE PRACTICAL VII: LINUX PROGRAMMING		SEMESTER - IV	
<b>OBJECTIVES:</b> The course aims <ul style="list-style-type: none"> <li>The basic commands and Shell Script in Linux</li> </ul>					
Credits: 2			Total Hours: 30		
S.No.	PROGRAMS	Hrs	CO		
1	Execute the File and Directory Commands.	3	CO1		
2	Execute the Process and Communication Oriented Commands.	3	CO2		
3	Execute Pipes and Filter Commands.	3	CO2		
4	Write shell script to add two numbers using command line arguments.	3	CO3		
5	Write a script to find the biggest number from given three number using command line arguments.	3	CO3		
6	Write a script to get current date, time, username, and current directory.	3	CO3		
7	Write a script to print given number in reverse order.	3	CO4		
8	Write a shell script to print the multiplication table of the given argument using for- loop.	3	CO4		
9	Write a script to determine whether given file exist or not, using command line arguments.	3	CO4		
10	Write an AWK script that uses all of its features.	3	CO5		
11	Write a shell script to display list of current logged in users.	3	CO5		
12	Write a shell script to remove the files which has file size as zero bytes.	3	CO5		
<b>WEB REFERENCES:</b>					
1.	<a href="https://www.jayatpoint.com/linux-tutorial">https://www.jayatpoint.com/linux-tutorial</a>				

2.	<a href="https://www.tecmint.com/">https://www.tecmint.com/</a>
3	<a href="http://linuxreviews.org/beginner/">http://linuxreviews.org/beginner/</a>

**COURSE OUTCOMES (CO):**

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

CO1	Get exposure of LINUX basic commands
CO2	Implement Pipes and Filter commands
CO3	Understand command line argument concepts
CO4	Execute the Shell script concepts
CO5	Implement File concepts using Shell Program




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18UCAMP502		CORE PRACTICAL IX: COMPUTER NETWORKS LAB		SEMESTER - V	
<b>COURSE OBJECTIVES:</b>					
The Course aims					
<ul style="list-style-type: none"> <li>To learn the hardware and software based network configuration using different network protocols</li> </ul>					
Credits: 2			Total Hours: 24		
S.No.	PROGRAMS	Hrs	CO		
1	Do the following Cabling works in a network a)Cable Crimping b) Standard Cabling and c) Cross Cabling	2	CO1		
2	Establish a LAN connection using three systems using bus topology.	2	CO1		
3	Establish Peer to Peer network connection using two systems in a LAN.	2	CO2		
4	Interface PCs using connectivity devices - Hub, router and switch.	2	CO2		
5	Configure IP Address in a system in LAN (TCP/IP Configuration)	2	CO3		
6	Transfer files between systems in LAN using FTP Configuration	2	CO3		
7	Login a system remotely using telnet protocol.	2	CO4		
8	Share a file and printer (remotely) between two systems in a LAN	2	CO4		
9	Establish security in a system using firewall configuration	2	CO4		
10	Create and share the user rights by accessing server for a specific user groups	2	CO4		

  
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**TIRUCHENGODE - 637 215**  
**Namakkal-Dt. Tamil Nadu, INDIA**



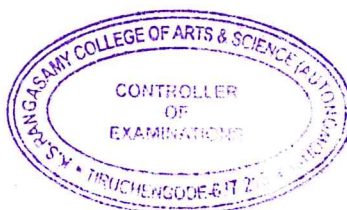
  
**Mr. M. PRASAD, M.Sc., M.B.A., M.Phil.,**  
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11	Install and configure the following a) A DHCP server in windows with IP Address ranging from 192.168.5.1 to 192.168.5.100 - b) Configure a DHCP Client	2	CO5
12	Transfer Files between wireless Communication.	2	CO5

**COURSE OUTCOMES (CO):**


On Successful Completion of this Course, the Student can	
CO1	Learn different types of network cabling and cable crimping
CO2	Learn to interconnect the personal computers using different topologies and network devices
CO3	Establish the different protocol configurations between the network systems
CO4	Configure the firewall for security, create and share user rights in server system
CO5	Configure the DHCP server and client using IP address




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18UCASBCP602	SBC PRACTICAL IV: MOBILE APPLICATION DEVELOPMENT	SEMESTER-VI	
<p><b>COURSE OBJECTIVES:</b> The course aims</p> <ul style="list-style-type: none"> <li>To develop and implement basic mobile applications in Androidx`</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 36</b>	
S.No	PROGRAMS	Hrs	CO
1	Create an application to display Hello World.	3	CO1
2	Create an Application to compute different Arithmetic Operations using Buttons.	3	CO2
3	Create an Application to Open Multiple Activities using Buttons.	3	CO2
4	Create an Application to Pickup order of different items using Checkbox.	3	CO3
5	Develop a simple Calculator application.	3	CO3
6	Create simple Home Screen Widget.	3	CO3
7	Create Chat Application.	3	CO4
8	Create simple Camera application.	3	CO4
9	Create Basic List View Demo.	3	CO4
10	Create a simple Web Browser.	3	CO5
11	Create a simple location finder application	3	CO5
12	Create a simple alarm clock.	3	CO5

  
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**COURSE OUTCOMES (CO):**

On Successful completion of this course, the student can	
CO1	Apply general programming knowledge to develop mobile applications
CO2	Design and develop user Interfaces for the Android platform
CO3	Write simple GUI based mobile applications
CO4	Learn to develop mobile applications using database concepts
CO5	Model new applications for hand held devices




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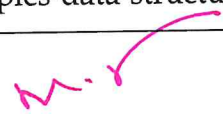
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18UCASBP401		SBC PRACTICAL II: DATA STRUCTURE USING C		SEMESTER - IV	
<b>OBJECTIVES:</b>					
The course aims					
<ul style="list-style-type: none"> <li>To implement various Data Structure concepts using C Programming Language</li> </ul>					
<b>Credits: 2</b>			<b>Total Hours: 30</b>		
S.No.	PROGRAMS	Hrs	CO		
1	Program to implement Matrix Addition.	3	CO1		
2	Program to implement Stack using array.	3	CO2		
3	Program to implement Queue using array.	3	CO2		
4	Program to implement Insert and Delete operation in Singly Linked List.	3	CO3		
5	Program to find the length of a Linked List.	3	CO3		
6	Program to Reverse a Linked List.	3	CO3		
7	Program to implement In-order Traversal.	3	CO4		
8	Program to implement Post-order Traversal.	3	CO4		
9	Program to implement Linear/Sequential Search.	3	CO4		
10	Program to implement Binary Search.	3	CO5		
11	Program to implement Insertion Sort.	3	CO5		
12	Program to implement Quick Sort.	3	CO5		
<b>WEB REFERENCES:</b>					
1.	<a href="https://www.tutorialspoint.com/data_structures_algorithms/index.htm">https://www.tutorialspoint.com/data_structures_algorithms/index.htm</a>				
2.	<a href="https://scanfreet.com/programs/operation/data-structure/">https://scanfreet.com/programs/operation/data-structure/</a>				
3.	<a href="https://www.sanfoundry.com/c-programming-examples-data-structures/">https://www.sanfoundry.com/c-programming-examples-data-structures/</a>				

  
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**COURSE OUTCOMES (CO):**

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

CO1	The student could implement 2-Dimensional Array concepts
CO2	The student could implement various operations associated with Stack, Queue and Linked List
CO3	The student could implement the concepts associated with Tree Traversals
CO4	The student could implement various Searching Techniques
CO5	The student could implement various Sorting Techniques



  
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18UCASBP301	SBC PRACTICAL I: WEB DESIGNING USING HTML, CSS AND JAVA SCRIPT	SEMESTER - III	
<b>COURSE OBJECTIVES:</b> The Course aims <ul style="list-style-type: none"> <li>• The creation of Web pages.</li> <li>• The formatting options available in CSS</li> <li>• The Client-side Scripting Language (JavaScript)</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 30</b>	
S.No.	PROGRAMS	Hrs	CO
<b>HTML &amp; CSS</b>			
1	Creating a page that exercises typography (paragraphs, headings) and page layout tags (div, span).	3	CO1
2	Creating a page to demonstrate the tags and attributes of a HTML table.	3	CO2
3	Creating a page to demonstrate Ordered List, Unordered List and Definition List.	3	CO2
4	Creating Bookmarks in HTML using hyperlinks.	3	CO3
5	Designing a web of hyperlinked documents using hyperlinks (min 3 pages).	3	CO3
6	Creating hyperlinks on images using Image maps.	3	CO3
7	Creating an Internal Stylesheet to adjust the layout options (setting margins, border and padding spaces) of different elements.	3	CO4
8	Creating an External Stylesheet to format the element colors and backgrounds.	3	CO4
<b>JAVASCRIPT</b>			
9	Creating a HTML page with few input controls and validate the data using javascript.	3	CO4
10	Creating a HTML page to demonstrate event handlers (onclick / onchange / onblur) and html	3	CO5



	content modification using javascript.		
11	Creating a HTML page to demonstrate Javascript string and math functions.	3	CO5
12	Creating a HTML page to create and manage Javascript Objects.	3	CO5
<b>WEB REFERENCES:</b>			
1.	<a href="https://www.w3schools.com/html/">https://www.w3schools.com/html/</a>		
2.	<a href="https://www.w3schools.com/css/">https://www.w3schools.com/css/</a>		
3	<a href="https://www.w3schools.com/js/">https://www.w3schools.com/js/</a>		

**COURSE OUTCOMES (CO):**

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

CO1	Create Static Web Pages
CO2	Link Webpages to form a Website
CO3	Format pages with CSS
CO4	Adjust the layout of webpage
CO5	Create dynamic pages with Client-side Scripting (Javascript)



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<b>18UCASBCP501</b>	<b>SBC PRACTICAL III: WEB SERVICES USING PYTHON</b>	<b>SEMESTER - V</b>	
<b>COURSE OBJECTIVES:</b>			
The Course aims			
<ul style="list-style-type: none"> <li>Describe the core syntax and semantics of Python programming language.</li> <li>Infer the Object-oriented Programming concepts in Python.</li> <li>To get practical knowledge of a popular programming language Python</li> </ul>			
<b>Credits: 2</b>		<b>Total Hours: 30</b>	
S.No.	PROGRAMS	Hrs	CO
1	Develop programs to understand the control structures of python	3	CO1
2	Develop programs to learn different types of structures (list, dictionary, tuples) in python	3	CO2
3	Develop programs to learn concept of functions scoping, recursion and list mutability.	3	CO2
4	Develop programs to understand working of exception handling and assertions.	3	CO3
5	Develop programs for data structure algorithms using python -searching, sorting and hash tables.	3	CO3
6	Develop programs to learn regular expressions using python.	3	CO3
7	Develop chat room application using multithreading.	3	CO4
8	Learn to plot different types of graphs using PyPlot.	3	CO4
9	Implement classical ciphers using python.	3	CO4
10	Draw graphics using Turtle.	3	CO5
11	Develop programs to learn GUI programming using Tkinter.	3	CO5

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12	Develop CRUD Application Using Web service.	3	CO5
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**COURSE OUTCOMES (CO):**

On Successful Completion of this Course, the Student can	
CO1	Able to apply the principles python programming
CO2	Implement object oriented concepts,
CO3	Implement database and GUI applications.
CO4	Develop web applications using python programming.
CO5	Develop and use Web Services using python.

*M.P.*



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