

## B.Sc. Computer Science

SEM	COURSE CODE	PART	COURSE	COURSE TITLE	Ins. Hrs.	CREDIT	MARKS		TOTAL
							CIA	ESE	
<b>I</b>	20U1LT1/LA1/LF1 /LH1/LU1	I	Language – I		6	3	25	75	100
	20UCN1LE1	II	English – I		6	3	25	75	100
	20UCS1CC1	III	<b>Core – I</b>	Programming in C	5	5	25	75	100
	20UCS1CC2P		<b>Core – II</b>	C Programming Lab	3	2	25	75	100
	20UMA1AC1		<b>Allied – I</b>	Calculus	5	4	25	75	100
	20UMA1AC2	IV	<b>Allied – II</b>	Numerical Methods	3	2	25	75	100
	20UCN1AE1		AEC-I	Value Education	2	2	-	100	100
<b>TOTAL</b>					<b>30</b>	<b>21</b>			<b>700</b>
<b>II</b>	20U2LT2/LA2/LF2 /LH2/LU2	I	Language – II		6	3	25	75	100
	20UCN2LE2	II	English – II		6	3	25	75	100
	20UCS2CC3	III	<b>Core – III</b>	Object Oriented Programming with C++	6	5	25	75	100
	20UCS2CC4P		<b>Core – IV</b>	C++ Programming Lab	3	2	25	75	100
	20UMA2AC3		<b>Allied – III</b>	Operations Research	4	3	25	75	100
	20UMA2AC4	IV	<b>Allied – IV</b>	Statistics	3	2	25	75	100
	20UCN2SE1		Skill Enhancement Course – I @	Soft Skills Development	2	2	-	100	100
<b>TOTAL</b>					<b>30</b>	<b>20</b>			<b>700</b>
<b>III</b>	20U3LT3/LA3/LF3 /LH3/LU3	I	Language – III		6	3	25	75	100
	20UCN3LE3	II	English – III		6	3	25	75	100
	20UCS3CC5	III	<b>Core – V</b>	Database Management Systems	4	4	25	75	100
	20UCS3CC6P		<b>Core – VI</b>	RDBMS Lab	3	2	25	75	100
	20UPH3AC5		<b>Allied – V</b>	Electricity and Magnetism	4	3	25	75	100
	20UPH3AC6P	IV	<b>Allied – VI</b>	Applied Physics – Practicals I	3	2	25	75	100
	20UCS3GE1		Generic Elective – I #		2	2	-	100	100
	20UCN3AE2		AEC-II	Environmental Studies	2	2	-	100	100
<b>TOTAL</b>					<b>30</b>	<b>21</b>			<b>800</b>
<b>IV</b>	20U4LT4/LA4/LF4 /LH4/LU4	I	Language – IV		6	3	25	75	100
	20UCN4LE4	II	English – IV		6	3	25	75	100
	20UCS4CC7	III	<b>Core – VII</b>	Java Programming	5	3	25	75	100
	20UCS4CC8P		<b>Core – VIII (a)</b>	Java Programming Lab	3	2	10	40	50
	20UCS4CC8		<b>Core – VIII (b)</b>	Internship	-	2	-	50	50
	20UPH4AC7		<b>Allied – VII</b>	Electronics	5	3	25	75	100
	20UPH4AC8P	IV	<b>Allied – VIII</b>	Applied Physics – Practicals II	3	2	25	75	100
	20UCS4GE2		Generic Elective – II #		2	2	-	100	100
	20UCN4EA		V	Extension Activities	NCC, NSS, etc.	-	1	-	-
<b>TOTAL</b>					<b>30</b>	<b>21</b>			<b>700</b>
<b>V</b>	20UCS5CC9	III	<b>Core – IX (a)</b>	Web Technology	4	3	10	40	50
	20UCS5CC9P		<b>Core – IX (b)</b>	Web Technology Lab	2	2	10	40	50
	20UCS5CC10		<b>Core – X</b>	Data Structures and Algorithms	5	5	25	75	100
	20UCS5CC11		<b>Core – XI</b>	Computer Organization and Architecture	5	5	25	75	100
	20UCS5CC12		<b>Core – XII</b>	Operating Systems	5	5	25	75	100
	20UCS5DE1		DSE – I **		5	4	25	75	100
	20UCS5SE2	IV	Skill Enhancement Course – II @		2	2	-	100	100
	20UCS5SE3		Skill Enhancement Course – III @		2	2	-	100	100
20UCS5EC1		<b>Extra Credit Course – I</b>	General Intelligence for Competitive Examinations	-	<b>4*</b>	--	<b>100*</b>	<b>100*</b>	
<b>TOTAL</b>					<b>30</b>	<b>28</b>			<b>700</b>
<b>VI</b>	20UCS6CC13	III	<b>Core – XIII</b>	Computer Graphics and Multimedia	5	5	25	75	100
	20UCS6CC14		<b>Core – XIV</b>	Computer Networks	5	5	25	75	100
	20UCS6CC15		<b>Core – XV</b>	Microprocessor Fundamentals	5	5	25	75	100
	20UCS6CC16P1		<b>Core – XVI (a)</b>	Digital and Microprocessor Lab	3	3	10	40	50
	20UCS6CC16P2		<b>Core – XVI (b)</b>	Multimedia Lab	2	2	10	40	50
	20UCS6DE2		DSE – II **		5	4	25	75	100
	20UCS6DE3	DSE – III **		4	4	25	75	100	
	20UCN6AE3	IV	AEC-III	Gender Studies	1	1	-	100	100
	20UCS6EC2		<b>Extra Credit Course – II</b>	Computer Science for competitive examinations	-	<b>4*</b>	--	<b>100*</b>	<b>100*</b>
<b>TOTAL</b>					<b>30</b>	<b>29</b>			<b>700</b>
<b>GRAND TOTAL</b>					<b>180</b>	<b>140</b>			<b>4300</b>
	20UCSAECA		<b>Extra Credit Course for all</b>	Online Course	-	<b>1*</b>	--	-	-

\* Not Considered for Grand Total and CGPA.

**# Generic Elective for other major department**

<b>Semester</b>	<b>Course Code</b>	<b>Course Title</b>
III	20UCS3GE1	Business Process Outsourcing
IV	20UCS4GE2	Web Design

**@Skill Enhancement Course**

<b>Semester</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
V	20UCS5SE2AP	Software Testing Lab
	20UCS5SE2BP	VB .Net Lab
	20UCS5SE3AP	Data Structures Lab
	20UCS5SE3BP	Operating Systems Lab

**\*\*Discipline Specific Elective**

<b>Semester</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
V	20UCS5DE1A	Software Engineering
	20UCS5DE1B	VB .Net
VI	20UCS6DE2A	Open Source Technology
	20UCS6DE2B	Python Programming
	20UCS6DE3AP	Open Source Lab
	20UCS6DE3BP	Python Programming Lab

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20UCS1CC1	CORE – I	PROGRAMMING IN C	5	5	100	25	75

### Course Outcomes (COs):

1. Use C language as the base for higher level course in programming
2. Acquire the basic constructs of programming languages.
3. Apply structured approach in program design
4. Apply suitable logic in solving problems
5. Develop applications to solve real world problems

### UNIT I

**15 hours**

The C Character Set – Constants, Variables and Keywords – Types of C Constants – Rules for Constructing Integer Constants – Rules for Constructing Real Constants – Rules for Constructing Character Constants – Types of C Variables – Rules for Constructing Variable Names – C Keywords – Data Types – Form of a C Program – Comments in a C Program – Types of C Instructions – Type Declaration Instruction – Arithmetic Instructions – Integer and Float Conversions – Type Conversion in Assignments – Hierarchy of Operations – Associativity of Operators – Control Instructions in C – The Decision Control Structure – The *if* Statement – The *if-else* Statement – Nested *if-elses* – Forms of *if* – Use of Logical Operators – # The Conditional Operators #.

### UNIT II

**15 hours**

The Loop Control Structure – Loops – The *while* Loop – The *for* Loop – The *break* Statement – The *continue* Statement – The *do-while* Loop – The Case Control Structure – Decisions using *switch* – The *goto* Keyword – Functions – Passing Values between Functions – Scope Rule of Functions – # Using Library Functions #.

### UNIT III

**15 hours**

Advanced Features of Functions – Call by Value – Call by Reference – An Introduction to Pointers – Pointer Notation – Recursion – Data Types Revisited – Storage Classes in C – The C Preprocessor – Features of C Preprocessor – Macro Expansion – File Inclusion – Conditional Compilation – *#if* and *#elif* Directives – # Miscellaneous Directives # – The Build Process.

### UNIT IV

**15 hours**

Arrays – More on Arrays – Pointers and Arrays – Two Dimensional Arrays – Arrays of Pointers – # Three-Dimensional Array # – Strings – More about Strings – Pointers and Strings – Standard Library String – Array of Pointers to Strings.

### UNIT V

**15 hours**

Structures – Array of Structures – Console Input/Output – Types of I/O – Console I/O Functions – File Input/Output – Data Organization – File Operations – Counting Characters, Tabs, Spaces – A File-Copy Program – File Opening Modes – # String (Line) I/O in Files #.

# ..... # Self-study portion

### Text Book:

Yashavant Kanetkar, *Let Us C*, BPB Publications, New Delhi, Thirteenth Edition, 2013.

**UNIT I** : Chapters 1, 2, 3 & 7

**UNIT II** : Chapters 4, 5 & 6

**UNIT III** : Chapters 6, 7 & 8

**UNIT IV** : Chapters 9 & 10

**UNIT V** : Chapters 11, 12 & 13

### Books for References:

1. E. Balagurusamy, *Programming in ANSI C*, Tata McGraw Hill Education Private Ltd., New Delhi, Fifth Edition, 2011.
2. D. Ravichandran, *Programming in C*, New Age International (P) Ltd., First Edition, 1996.

### Web Reference:

<https://www.programiz.com/c-programming>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
I	20UCS1CC1	PROGRAMMING IN C					5	5			
Course Outcomes COs	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓		✓		✓			
CO2	✓	✓				✓	✓	✓	✓		
CO3	✓	✓	✓	✓		✓	✓	✓	✓		
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 40, Relationship: High											

Prepared by:

1. Dr. O. A. Mohamed Jafar

Checked by:

1. Dr. G. Ravi

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20UCS1CC2P	CORE – II	C PROGRAMMING Lab	3	2	100	25	75

Develop a Program to illustrate the use of

1. Arithmetic Statements
2. Different forms of if statements (*if, if-else and nested if-elses*)
3. Various Loop Control Structures (*while, do-while and for loop*)
4. Case Control Structure (*switch*)
5. Function
6. Call by Value and Call by Reference (Pointers)
7. Macro definitions
8. Arrays
9. String Handling Functions
10. Structures
11. Console I/O Functions
12. File

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Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20UCS2CC3	CORE – III	OBJECT ORIENTED PROGRAMMING IN C++	6	5	100	25	75

#### Course Outcomes:

1. Acquire skills in object oriented programming concepts
2. Use object oriented concepts as the base for higher level course in programming
3. Differentiate structured and object-oriented programming.
4. Identify classes, objects, members of a class and the relationships among them needed for finding the solution to specific problem
5. Develop object oriented programs to solve real life problems

#### UNIT I

**18 hours**

Principles of Object Oriented Programming – Software Evolution – Basic Concepts of Object Oriented Programming – Benefits of OOP – Applications of OOP – Structure of C++ Program – Tokens – Keywords – Identifiers and Constants – Basic Data Types – User Defined Data Types – Derived Data Types – Declaration of Variables – Operators – Manipulators – # Expressions and their types # – Control Structures.

#### UNIT II

**18 hours**

Functions – The Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Recursion – Function Overloading – Classes and Objects – Specifying a Class – Defining Member Functions – A C++ program with Class – # Static Data Members – Static Member Functions # – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects.

#### UNIT III

**18 hours**

Constructors and Destructors – Constructors - Parameterized Constructors – Multiple Constructors in a Class – Copy Constructors – Destructors – Operator Overloading – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – # Overloading Binary Operators using Friends # – Rules for Overloading Operators.

#### UNIT IV

**18 hours**

Inheritance: Extending Classes – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes – Pointer, Virtual Functions and Polymorphism – Pointers –Pointers to Objects – this Pointer – # Pointers to Derived Classes # – Virtual Functions – Pure Virtual Functions.

#### UNIT V

**18 hours**

Managing Console I/O Operations – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting end-of-file – # More about Open( ): File Modes #.

# ..... # Self-study portion

#### Text Book:

E. Balagurusamy, *Object-Oriented Programming with C++*, Tata McGraw Hill Education Private Ltd., New Delhi, Fifth Edition, 2011.

**UNIT I** : Chapter 1, Chapter 2 (Section 2.6) & Chapter 3

**UNIT II** : Chapter 4 (Sections 4.1 to 4.7, 4.9, 4.10) & Chapter 5 (Sections 5.3 to 5.5, 5.11 to 5.16)

**UNIT III** : Chapter 6 (Sections 6.1 to 6.4, 6.7, 6.11) & Chapter 7 (Sections 7.1 to 7.5, 7.8)

**UNIT IV** : Chapter 8 (Sections 8.1 to 8.3, 8.5, 8.6, 8.9) & Chapter 9 (Sections 9.1 to 9.7)

**UNIT V** : Chapter 10 (Sections 10.1 to 10.5) & Chapter 11 (Sections 11.1 to 11.5)

**Books for Reference:**

1. Robert Lafore, *Object-Oriented Programming in Turbo C++*, Galgotia Publications Pvt. Ltd., New Delhi, Third Edition, Reprint-2014.
2. Bjarne Stroustrup, *The C++ Programming Language*, Addison-Wesley, New York, Third Edition, Eighth Impression-2012.

**Web References:**

- [https://www.w3schools.com/cpp/cpp\\_oop.asp](https://www.w3schools.com/cpp/cpp_oop.asp)  
<https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
II	20UCS2CC3	OBJECT ORIENTED PROGRAMMING IN C++					6	5			
Course Outcomes COs	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓		✓		✓			
CO2	✓	✓	✓	✓		✓		✓			
CO3	✓	✓		✓		✓		✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 38, Relationship: High											

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Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20UCS2CC4P	CORE – IV	C++ PROGRAMMING LAB	3	2	100	25	75

Develop a Program to illustrate the use of

1. Class and object.
2. a) new and delete operators  
b) Scope resolution operator
3. a) Call by value and call by reference  
b) Inline function
4. a) Member functions defined inside the class  
b) Member functions defined outside the class
5. a) Function overloading  
b) Friend function
6. a) Arrays of objects  
b) Objects as function arguments
7. a) Dummy and Parameterized Constructors  
b) Overloaded Constructors
8. a) Unary Operator Overloading  
b) Binary Operator Overloading
9. a) Single Inheritance  
b) Multiple Inheritance
10. a) Single character and line-oriented input/output functions  
b) ios format functions
11. File

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