DEPARTMENT OF COMPUTER SCIENCE

B.C.A. (COMPUTER APPLICATIONS)

(Students admitted during 2021-2022 Onwards)

(Under CBCS with Outcome Based Education (OBE) Pattern)

SYLLABUS

I & II SEMESTER

GOBI ARTS & SCIENCE COLLEGE

(Govt. Aided Autonomous Co-educational Institution, Affiliated to Bharathiar University, Coimbatore, Accredited with 'A' Grade by NAAC (4th cycle) and Recognised as a STAR College by DBT, Government of India)

KARATTADIPALAYAM POST,

GOBICHETTIPALAYAM - 638453

ERODE DISTRICT.

GOBI ARTS & SCIENCE COLLEGE (Autonomous)

Vision

Social and Economic upliftment of the people of this area through value based quality Education.

Mission

Committed to serve the society with humility and trust, devoid of exploitation; to impart value based higher education, particularly to the socially and economically deprived sections of this area; to make students of this institution worthy citizens of our glorious motherland.

DEPARTMENT OF COMPUTER SCIENCE

Vision

To inculcate better programming skills among rural area students.

Mission

To impart value based technical education and educate students towards the design and development of software produts for the benefit of computer industry and society.

GOBI ARTS & SCIENCE COLLEGE (AUTONOMOUS): GOBICHETTIPALAYAM

SCHEME OF EXAMINATIONS - B.C.A. (COMPUTER APPLICATIONS) (21 BATCH)

No.	Course Code	Part	Course	Total Hours	Hrs/ Exam	Maximum Marks		Total Marks	Credits
						CIA	EOS		
			SEMESTER – I						
1	21U1TM01	I	TAMIL – I	90	3	50	50	100	3.0
2	21U2EN01	II	ENGLISH – I	90	3	50	50	100	3.0
3	21UACA01	III	MAJOR CORE : OFFICE AUTOMATION TOOLS	60	3	50	50	100	3.5
4	21UACA02	III	DIGITAL COMPUTER FUNDAMENTALS	60	3	50	50	100	3.5
5	21UBCA01	III	ALLIED CORE : COMPUTER ORIENTED NUMERICAL METHODS	90	3	50	50	100	5.0
6	21UACAP1	III	MAJOR CORE PROGRAMMING LAB - I : (OFFICE AUTOMATION TOOLS)	60	3	50	50	100	2.0
7	21U4FN01	IV	FOUNDATION SUBJECT - A : GENERAL AWARENESS		1.5		100	100	1.0
			SEMESTER – II						
8	21U1TM02	I	TAMIL – II	90	3	50	50	100	3.0
9	21U2EN02	II	ENGLISH – II	90	3	50	50	100	3.0
10	21UACA03	III	MAJOR CORE : PROGRAMMING IN C	60	3	50	50	100	3.5
11	21UACA04	III	COMPUTER SYSTEM ARCHITECTURE	60	3	50	50	100	3.5
12	21UBCA02	III	ALLIED CORE : COMPUTER ORIENTED STATISTICAL METHODS	60	3	50	50	100	5.0
13	21UACAP2	III	MAJOR CORE PROGRAMMING LAB - II : (C)	60	3	50	50	100	2.0
14	21U4FN02	IV	FOUNDATION SUBJECT - B : ETHICS & CULTURE		3		100	100	2.0
			SEMESTER – III						
15	21UACA05	III	MAJOR CORE : DATA STRUCTURES	60	3	50	50	100	3.5
16	21UACA06	III	OPERATING SYSTEM	60	3	50	50	100	3.5
17	21UACA07	III	CLIENT SERVER COMPUTING	60	3	50	50	100	3.5
18	21UACA08	III	OBJECT ORIENTED PROGRAMMING WITH C++	60	3	50	50	100	3.5
19	21UBCO61	III	ALLIED CORE : INTRODUCTION TO ACCOUNTANCY	90	3	50	50	100	5.0
20	21UACAP3	III	MAJOR CORE PROGRAMMING LAB - III : (DATA STRUCTURES IN C)	60	3	50	50	100	2.0
21	21UACAP4	III	MAJOR CORE PROGRAMMING LAB - IV : (C++)	60	3	50	50	100	2.0
22		IV	FOUNDATION SUBJECT – B		3		100	100	2.0

Contd…

			SEMESTER - IV						
23	21UACA09	III	MAJOR CORE : RELATIONAL DATABASE MANAGEMENT SYSTEMS	75	3	50	50	100	4.0
24	21UACA10	III	VISUAL PROGRAMMING	75	3	50	50	100	4.0
25	21UACO61	III	MARKETING	90	3	50	50	100	4.0
26		III	ALLIED OPTIONAL :	90	3	50	50	100	5.0
27	21UACAP5	III	MAJOR CORE PROGRAMMING LAB - V : (RDBMS & ACCOUNTING PACKAGE)	60	3	50	50	100	2.0
28	21UACAP6	III	MAJOR CORE PROGRAMMING LAB - VI : (VISUAL PROGRAMMING)	60	3	50	50	100	2.0
29	21U4FN05	IV	FOUNDATION SUBJECT – B : ENVIRONMENTAL STUDIES		3		100	100	2.0
30		V	CO-CURRICULAR ACTIVITIES						1.0
			SEMESTER - V						
31	21UACA12	III	MAJOR CORE : PYTHON PROGRAMMING	60	3	50	50	100	4.5
32	21UACA13	III	JAVA PROGRAMMING	60	3	50	50	100	4.5
33	21UACA14	III	SYSTEM ANALYSIS AND DESIGN	60	3	50	50	100	4.5
34	21UACA15	III	COMPUTER NETWORKS	60	3	50	50	100	4.5
35	21UACAP7	III	MAJOR CORE PROGRAMMING LAB - VII : (JAVA PROGRAMMING)	60	3	50	50	100	2.5
36	21UACAP8	III	MAJOR CORE PROGRAMMING LAB – VIII : (PYTHON PROGRAMMING)	60	3	50	50	100	2.5
37		III	MAJOR OPTIONAL :	90	3	50	50	100	4.0
			SEMESTER - VI						
38	21UACA16	III	MAJOR CORE : WEB DESIGN	90	3	50	50	100	4.5
39	21UACAP9	III	MAJOR CORE : PROGRAMMING LAB - IX : (WEB DESIGN)	60	3	50	50	100	2.5
40	21UECA01	III	MAJOR SKILL BASED PAPER : COMPUTER GRAPHICS	90	3	50	50	100	4.5
41	21UECAP1	III	MAJOR SKILL BASED PRACTICAL: PROGRAMMING LAB - X : (COMPUTER GRAPHICS)	60	3	50	50	100	2.5
42	21UACA17 21UACAPA 21UACAV1	III III III	MAJOR CORE : PROGRAMMING WITH PHP PROGRAMMING LAB - XI : (PHP) **(OR)** PROJECT WORK	90 60 150	3 3 	50 50 50	50 50 50	100 100 100	4.5 2.5 7.0

CREDITS:

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PART I : 6 PART II : 6 PART III : MAJOR : 100

ALLIED: 20

---> 120

PART IV : 7 PART V : 1 TOTAL : 140

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

I. END OF SEMESTER (EOS) EXAMINATIONS:

1. Part I, II & III-Theory: 50 Marks

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 1 = 10	MCQ	50
K2	B (Either or Pattern)	5 × 3 = 15	Short answers	
K3 & K4	C (Either or Pattern)	5 × 5 = 25	Descriptive/Detailed	

2. Practical Examinations: 50 Marks

Knowledge Level	Section		Total
	Practical	Record work	
K3	45	05	50
K4			
K5			

II. CONTINUOUS INTERNAL ASSESSMENT (CIA):

1. Test – I & II: 30 Marks (Theory)

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	8 × 1 = 8	MCQ	30
K2	B (Either or Pattern)	4 × 3 = 12	Short answers	
K3 & K4	C (Either or Pattern)	2 × 5 = 10	Descriptive/Detailed	

2. Test –III: (Model Exam)

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 1 = 10	MCQ	50 Marks
K2	B (Either or Pattern)	5 × 3 = 15	Short answers	
K3 & K4	C (Either or Pattern)	5 × 5 = 25	Descriptive/Detailed	

3. Practical Internal Assessment: 50 Marks

Knowledge Level	Section					Total
	One Test	Lab Performance	Observation Submission in Time	Record Submission in Time	Attendance	
K3	30	05	05	05	05	50
K4						
K5						

Components of Continuous Internal Assessment (CIA)

Components	Allotment of Internal Assessment Marks for a Maximum of 50 Marks
Two Tests (30+30=60/4)	15
Model Exam (50 Marks)	20
Assignment	05
Quiz / Term Paper / Composition / Field Visit / Industrial Visit / GD etc.	05
Attendance	05
CIA Total	**50**

PROGRAMME SPECIFIC OBJECTIVES

The students will be able to do, on successful completion of programme

1. Acquire fundamentals of digital computer, architecture, open source programming languages, numerical and statistical ability to meet the requirements of computing.
2. Attain sufficient knowledge related to computer domains, possess technical, soft and hard skills, apply them effectively in teamwork.
3. Apply legal and social aspects of recent computing technologies, exhibit effective communication and practice the profession with ethical responsibilities.
4. Design and develop software based solutions for real-world problems, serving effectively to the requirements of the computer field and society.
5. Impart life-long learning habits over the technological changes of computers, building entrepreneurship skills, motivated towards higher studies and make them leaders in the chosen field.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO1: Understand and analyze the principles and concepts of computer applications domain to apply ethical, legal and social integrity to act as a responsible computer applications professional.

PSO2: Identify theoretical substratum and appropriate algorithmic principles to model and design the computational systems.

PSO3: Explore emerging technologies in diverse areas of computer application and inculcate skills for successful career, entrepreneurship and higher studies.

PSO4: Ability to apply the computer concepts and practices through emerging technologies for developing software tools.

PSO5: Equip students to find, analyze and proliferate the field of computer application at diverse levels for implementing novel solutions that cater to the dynamic nature of computer application industries.

Programme Code:	BCA	**Programme Title:**	Computer Applications	
Course Code:	21UACA01	**Course Title:**	**Batch:**	2021
Total Hours:	60	Office Automation Tools (Common for BCA, IT)	**Semester:**	I
			Credits:	3.5

Course Objective

The course aims

- To acquire basic knowledge in Linux environments and its applications in the area of business and others.
- To learn how to get started with Writer and identifying the features on the application window.
- To learn to design an image using GIMP.
- To creating formulas to calculate data using Calc layout and prepare presentation using impress tool.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K2, K4	**CO1**	Understand the basics and types of linux operating system, files, directories and analyze the installation steps.
K2, K3	**CO2**	Understand the fundamentals of open office writer, create and edit documents.
K1, K2, K3, K5	**CO3**	Know about various operations in open office calc, create spread sheets, apply formulas and generate graphs.
K2, K3, K4	**CO4**	Learn about various tools and layers in open office GIMP and design images
K2, K4, K5	**CO5**	Acquire knowledge about open office Impress and design powerful presentation applying various styles.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**LINUX:** Basic of Linux – Getting started with Linux, Working with K Desktop Environment, Working with Files and Directories.	**12**
II	**Writer:** Getting started with OPenOffice.org Writer; Editing Documents in Writer, Formatting the Document.	**12**
III	**Calc:** Getting started with OpenOffice.org Calc, Working with Functions, ***Calc interface**** and Operators, Working with the OpenOffice.Org Calc Layout.	**12**
IV	**GIMP:** Introducing GIMP, Working with Tools, Working with Layers and Text.	**12**
V	**Impress:** Getting started with OpenOffice.org Impress, Working with Presentations - ***Presentation using templates**.	**12**

<* - Self Study>

Text Book:

1. Vikas Gupta, *"Linux and Open Office Course Kit"*, First Edition, Dreamtech Press, 2010. (Unit I- V)

Reference Books:

1. Andy Channelle, *"Beginning Open Office 3: Form Novice to Professional"*, First Edition, Apress, 2009.
2. Greg M.Perry, *"Sams Teach Yourself Open office.org All In One"*, First Edition, Prentice Hall, 2004.
3. Jeffery A.Riley, *"Introduction to Open office.org"*, First Edition, Prentice Hall, 2009.
4. Gurdy Leete, Ellen Finkelstein, Mary Leete, ***"****Open office.org for dummies",* First Edition, Wiley Publishing Inc, 2004.

E-references:

1. https://www.linode.com/docs/tools-reference/introduction-to-linux-concepts/
2. https://www.libreoffice.org/discover/what-is-opendocument/
3. https://documentation.libreoffice.org/en/english-documentation/calc/

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	Programme Title:	Computer Applications	
Course Code:	21UACA02	Course Title:	Batch:	2021
Total Hours:	60	Digital Computer Fundamentals (Common for BCA and CT)	Semester:	I
			Credits:	3.5

Course Objective

The course aims

- To learn and understand the Number Systems, Gates, Map and Digital Logic Circuits.
- To understand about digital components and data representation.
- To get knowledge about fundamentals of computer organization, design and basic computer programming languages.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K2, K4	**CO1**	Ability to understand various number systems, gates, maps and digital logic circuits.
K4, K2	**CO2**	Understand the concept of digital logic circuits and data representation.
K2	**CO3**	Get the knowledge about register transfer and micro operations.
K1, K3, K2	**CO4**	Remember and understand the basic organization and design of computers.
K1, K4	**CO5**	Explain the concept of various basic languages such as machine, assembly and input/output programming and the design of micro program.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**DIGITAL LOGIC CIRCUITS**: Digital Computers – Logic Gates – Boolean Algebra – Map Simplification – Combinational Circuits – Flipflop – Sequential Circuits.	**12**
II	**DIGITAL COMPONENTS:** Integrated circuits – decoders – Multiplexers – Registers – Shift Registers – Binary Counters – Memory Unit. **DATA REPRESENTATION:** Data types – Complements – Fixed – Point Representation – Floating point Representation – Other Binary Codes – Error Detection Codes.	**12**
III	**REGISTER TRANSFER AND MICROOPERATIONS:** Register Transfer Language –Register Transfer – Bus and Memory Transfers – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations – Arithmetic Logic Shift Unit.	**12**
IV	**BASIC COMPUTER ORGANIZATION AND DESIGN:** Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle –Memory – Reference Instructions – Input– Output and Interrupt- Complete Computer Description – Design of Accumulator Logic.	**12**

V	**PROGRAMMING THE BASIC COMPUTER:** Machine Language – Assembly Language – The Assembler – Program Loops – Programming Arithmetic and logic operations – Subroutines –Input-Output Programming. **MICROPROGRAMMED CONTROL:** Control Memory – Address Sequencing –Microprogram Example – Design of Control Unit- ***Machine language, Program loops****.	**12**

<* - ***Self Study***>

Text Book:

1. M.Morris Mano, *"Computer System Architecture"*, Third Edition, Prentice – Hall of India Private Limited, 2013. (Unit I – V)

Reference Books:

1. Thomas C.Bartee, *"Digital Computer Fundamentals"*, Sixth Edition, Tata McGraw Hill, 2001.
2. V.Rajaraman, T.RadhaKrishnan, *"An Introduction To Digital Computer Design"*, Fifth Edition, PHI, 2009.
3. Donald P.Leach, Albert Paul Malvino, "*Digital Principles and Applications"*, First Edition, Tata McGraw Hill, 2005.

E-references:

1. https://www.tutorialspoint.com/computer_logical_organization/index.htm
2. https://www.studytonight.com/computer-architecture/basics-of-digital-components
3. https://www.slideshare.net/ahmadsajjadsafi/digital-electronics-46529798

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	**Programme Title:**	Computer Applications	
Course Code:	21UBCA01	**Course Title:**	**Batch:**	2021
Total Hours:	90	Computer Oriented Numerical Methods (Common for CS, BCA, IT, CT)	**Semester:**	I
			Credits:	5.0

Course Objective

The course aims

- To provide students with specific knowledge and skills relevant to their disciplines and careers to find accurate solution to the given problem.
- To accurate solutions for Interpolation, Numerical Differentiation and Integration.
- To numerical solution of ordinary differential equations.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcomes
K1, K2, K3	**CO1**	Understand the basics of numerical Algebraic and Transcendental Equations, Remember and solve the problems.
K1, K2, K3	**CO2**	Understand and solve simultaneous Linear Algebraic Equations using various methods.
K1, K3, K4	**CO3**	Remember the concepts of interpolation analyse and apply it for numerical differentiation.
K2, K3, K4, K5	**CO4**	Choose, formulate and implement appropriate numerical methods for solving integration problems.
K2, K3, K4, K5	**CO5**	Understand, analyse and evaluate various methods of Ordinary Differential Equations.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	The Solution of Numerical Algebraic and Transcendental Equations – Bisection method – Iteration method – Newton-Raphson method – The method of False Position.	**18**
II	The Solution of Simultaneous Linear Algebraic Equation – Gauss Elimination method – ***Gauss Jordon Elimination method**** – Triangularization Method – Gauss Seidal method – Gauss Jacobi method.	**18**
III	Interpolation – Newton's Forward Interpolation formula – Newton's Backward Interpolation formula – LaGrange's formula. Numerical Differentiation – Newton's Forward Difference formula – ***Newton's Backward Difference formula****.	**18**
IV	Numerical Integration – Trapezoidal rule – Simpson's One –third rule – Simpson's three – eighths rule.	**18**
V	Numerical solution of ordinary differential equations – Taylor method – Euler method – Euler Modified method – Runge-Kutta method – Predictor Corrector Methods – Adam's Method – Milne Methods.	**18**

Text Book:

1. P. Kandasamy, K.Thilagavathi, K.Gunavathi, "*Numerical Methods"*, Third Edition, Chand & Company Ltd, New Delhi, 2005.

Reference Books:

1. V.Rajaraman, "*Computer Oriented Numerical Methods"*, Third Edition, PHI Learning Private Limited, 2011.
2. S.Sastry, "*Introductory Methods of Numerical Analysis* " Fifth Edition, PHI Learning Private Limited, 2012.
3. E.V.Krishnamurthy, S.K.Sen, "*Numerical Algorithms"*, Third Edition, Affilited East-West Press Private Limited, 1986.

E-references:

1. https://www.math.ust.hk/~machas/numerical-methods.pdf
2. https://en.wikibooks.org/wiki/Numerical_Methods/Equation_Solving
3. http://mathworld.wolfram.com/NumericalIntegration.html

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	Programme Title:	Computer Applications	
Course Code:	21UACAP1	Course Title::	Batch:	2021
Total Hours:	60	Programming Lab - I: (Office Automation Tools) (Common for BCA, IT)	Semester:	I
			Credits:	2.0

Course Objective

The course aims

- To acquire basic knowledge in Linux environment and its applications in the area of business and other works.
- To learn how to get started with Writer and identifying the features on the application window.
- To learn to design an image using GIMP.
- To create formulas to calculate data using Calc layout and prepare presentation using impress tool.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcomes
K4, K5	CO1	Understand the fundamentals of open office writer to create and edit documents
K3, K5	CO2	Know about various data analysis, at the time of training, create charts and more complex calculations.
K3, K5	CO3	Understand the knowledge about the calc, construct formulas and apply built-in functions.
K3, K4	CO4	Understand the basis of GIMP design and develop programs.
K3, K4	CO5	Understand the IMPRESS tool to apply transition, animation and sound merging in various slides.

K1 – Remember**; K2 –** Understanding**; K3 –** Apply**; K4 –** Analyze**; K5 –** Evaluate

SYLLABUS

1. Create an open Office Writer application with 10 lines and perform various task such as Bold, Italic, Underline, Font-Size, Color, Background color, Line Spacing, Header & Footer, Page Numbering, Bullets & Numbering and Change Case.
2. Design an Invitation Card in Writer.
3. Design a Time Table in Writer.
4. Perform Mail-Merge for many companies in different cities through Writer.
5. Maintain a worksheet of Student Mark List for each semester in Open Office Calc.
6. Create a Chart for Student Mark List in a worksheet in Calc.
7. Maintain the sales details for the company for six days in a week for the branches and perform the following operations in Calc.
   a. Sales details Day wise
   b. Sales details Branch wise
   c. Sales details Product wise
   d. Highest Sales details in Product wise.

8. Create Consolidated Mark sheet for three semesters using Calc. 9. Develop a table for Saving Scheme in Calc and calculate the simple interest amount using the principle amount, number of years and rate of interest.
10. Design a Greeting card using GIMP. 11. Create a Rainbow using GIMP. 12. Design sun using GIMP. 13. Design Planet and Saturn using GIMP.
14. Design a presentation about the college in Open Office Impress. 15. Design a presentation for product advertisement in Impress. 16. Design a presentation for the Newspaper in Impress.

Text Book:

1. Vikas Gupta, *"Linux and Open Office Course Kit"*, First Edition, Dreamtech press, 2010. (Unit I- V)

Reference Books:

1. Andy Channelle, *"Beginning Open Office 3: Form Novice to Professional"*, First Edition, Apress, 2009.
2. Greg M.Perry, *"Sams Teach Yourself Open office.org All In One"*, First Edition, Prentice Hall, 2004.
3. Jeffery A.Riley, *"Introduction to Open office.org"*, First Edition, Prentice Hall, 2009.
4. Gurdy Leete, Ellen Finkelstein, Mary Leete, **"***Open office.org for dummies",* First Edition, Wiley publishing Inc, 2004.

E-references:

1. https://www.linode.com/docs/tools-reference/introduction-to-linux-concepts/
2. https://www.libreoffice.org/discover/what-is-opendocument/
3. https://documentation.libreoffice.org/en/english-documentation/calc/

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	**Programme Title:**	Computer Applications	
Course Code:	21UACA03	**Course Title:**	**Batch:**	2021
Total Hours:	60	Programming in C (Common for CS, BCA, IT, CT)	**Semester:**	II
			Credits:	3.5

Course Objective

The course aims

- To provide a comprehensive study of the procedure oriented concept using C programming language.
- To facilitates the students to elaborately study about C programming techniques.
- To implement these techniques to solve the variety of real-time problems.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	**CO1**	Remember and understand the basic data types, operators and to write & compile simple programs.
K1, K2, K5	**CO2**	Understand the conditional statements & loops in programs.
K1, K2, K3, K5	**CO3**	Understand and apply the concept of arrays & functions and design the application programs.
K1, K2, K3, K4, K5	**CO4**	Analyze the usage of structures, unions, pointors and make them to efficiently access the memory.
K3, K4, K5	**CO5**	Understand and evaluate the file operations and write programs to handle the data using files.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**C FUNDAMENTALS:** Overview of C, Constants, Variables and Data Types, Operators and Expressions, Data Input and Output Operators – Simples Programs.	**12**
II	**CONTROL STATEMENTS:** If Statements, switch, Conditional Operator, While, do..While, for statements, break, continue, Storage Classes – Programs.	**12**
III	**ARRAY AND FUNCTIONS:** One and Multi dimensional arrays, Handling of Character Strings – Programs. USER DEFINED FUNCTIONS: Programs - ***Simple Function****.	**12**
IV	**STRUCTURE AND POINTERS:** Structures and Unions – Programs. **POINTERS:** Introduction, Pointer Expressions, Pointers and Arrays, Pointers and Character Strings, Pointers and Functions, Pointers and Structure – Programs - ***Simple Pointers****.	**12**
V	**FILE AND THE PREPROCESSOR:** File Management in C – Programs, Concept of Dynamic Allocation of Memory and Linked List, The Preprocessor.	**12**

< - **Self Study**>*

Text Book:

1. E. Balagurusamy, "*Programming In Ansi C*", Second Edition, Tata Mcgraw Hill Publications, 2003. (Unit – I to V)

Reference Books:

1. Ashok N. Kamthane, "*Programming in C",* Second Edition, Pearson, 2006.
2. Herbert Schildt, *"C: The Complete Reference*", Fourth Edition, Tata Mcgraw-Hill, 2008.
3. Shubhnandan S, Jamual, "*Programming in C*", First Edition, Pearson, 2014.
4. Subburaj R, "*Programming in C",* First Edition, Vikas Publishing, 2012.

E-references:

1. https://www.cprogramming.com/reference/
2. https://en.cppreference.com/w/c/language
3. https://developerinsider.co/best-c-programming-book-for-beginners/

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	Programme Title:	Computer Applications	
Course Code:	21UACA04	Course Title:	Batch:	2021
Total Hours:	60	Computer System Architecture (Common for BCA, CT)	Semester:	II
			Credits:	3.5

Course Objective

The course aims

- To get knowledge about all the aspects of the design and organization of CPU.
- To identify the main types of memory technology.
- To know how interrupts are used to implement I/O control and data transfers.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2	CO1	Learn about the concepts of CPU, Instruction Formats and its types, Stack and RISC.
K1, K2	CO	Remember the concepts of RISC and understand the applications of parallel processing using pipeline.
K2, K4	CO3	Understand the logics of arithmetic algorithms and analyze the decimal and floating point arithmetic operations.
K2, K4	CO4	Know the basic of peripheral device, understand and analyze various types of transformation of data.
K2, K5	CO5	Gain knowledge about categories of memory organization and its underlying concepts along with multiprocessor organization.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Contents**	**No. of Hours**
I	**CENTRAL PROCESSING UNIT:** Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control – Reduced Instruction Set Computer (RISC)	**12**
II	**PIPELINE AND VECTOR PROCESSING:** Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction Pipeline – RISC Pipeline – Array Processors.	**12**
III	**COMPUTER ARITHMETIC:** Addition and Subtraction – Multiplication Algorithms – Division Algorithms – Floating-Point Arithmetic Operations – Decimal Arithmetic Unit – Decimal Arithmetic Operations.	**12**
IV	**INPUT – OUTPUT ORGANIZATION:** Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – DMA – Input-Output Processor – Serial Communication.	**12**
V	**MEMORY ORGANIZATION –** Memory Hierarchy – Main Memory – ***Auxiliary Memory**** – Associative Memory – ***Cache Memory**** – Virtual Memory. **MULTIPROCESSORS:** Characteristics - Interconnection Structures – Interprocessor Arbitration – Interprocessor Communication and Synchronization – Cache Coherence.	**12**

<* - ***Self Study***>

Text Book:

1. M. Morris Mano, *"Computer System Architecture"*, Third Edition,Pearson Prentice Hall, 2013. (Unit I – V)

Reference Books:

1. B.Govindarajalu, *"Computer Architecture and Organization"*, Fourth Edition, Tata McGraw Hill, 2006.
2. Thomas C.Bartee, *"Computer Architecture and Logic Design"*, First Edition, McGraw Hill International Editions, 2006.
3. John P.Hayees, *"Computer Architecture and Organization",* Third Edition, McGraw Hill International Editions, 2005.

E-references:

1. https://nptel.ac.in/courses/106103068/17
2. https://www.tutorialspoint.com/Computer-System-Architecture
3. https://www.slideshare.net/kumar_vic/computer-system-architecture
4. https://www.youtube.com/watch?v=So9SR3qpWsM

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	Programme Title:	Computer Applications	
Course Code:	21UBCA02	Course Title::	Batch:	2021
Total Hours	60	Computer Oriented Statistical Methods (Common for CS, BCA, IT, CT)	Semester:	II
			Credits:	5.0

Course Objective

The course aims

- To work with computer oriented statistical problems.
- To understand the various types of measures and statistical methods**.**
- To make students aware of SPSS package in accounting.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K3	CO1	Understand the basic statistical parameters and calculate Mean, Median and Mode for the tabulated data.
K1, K2, K3	CO2	Remember the meaning of statistical indicators and calculate Measures of Dispersion, Skewness, Moments and Kurtosis.
K1, K2, K3, K5	CO3	Gain knowledge of Correlation and Regression, Calculate methods of Correlation Coefficient and Regression Equations.
K1, K3, K4, K5	CO4	Know the underlying concepts of Index Numbers and solve numerical applications.
K2, K3, K4, K5	CO5	Understand the SPSS tools and manipulate files and graphs using SPSS.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** - Evaluate

	SYLLABUS	
Unit	**Content**	**No. of Hours**
I	**Statistics:** Definition – Classification and Tabulation of Data – **Measures of Central values:** Mean – Median – Mode – ***Their Relationship**** – Problems.	**12**
II	**Measures of Dispersion:** Range – Quartile Deviation - Mean Deviation – Standard Deviation - **Skewness, Moments and Kurtosis:** Introduction - Measures of Skewness, Moments and Kurtosis.	**12**
III	**Correlation:** Meaning - Types – Methods – Scatter diagram - Karl Pearson's coefficient of correlation – Rank correlation – Problems - **Regression:** Uses – Regression lines – Regression equations – Curve Fitting – Straight line, parabola and exponential curves.	**12**
IV	**Index numbers**: Definition – Uses – Unweighted and weighted index numbers – properties of good index numbers – Cost of Living index – Baseline Shifting – Splicing and deflating index numbers.	**12**
V	**SPSS:** SPSS for windows – SPSS Windows process – Creating and editing data file – Managing Data – ***Graphs****.	**12**

<* - ***Self Study***>

Text Books:

1. R.S.N.Pillai, Bagavathi, "*Statistics*", Third Edition, S.Chand & Company Ltd, New Delhi, 2012. (UNIT I - IV)
2. Darren George, Paul Mallery, "*SPSS For Windows Step By Step*", Eighth Edition, Pearson Education. (UNIT- V).

Reference Books:

1. C.B.Gupta,Vijay Gupta,"*An Introduction To Statistical Methods"*, Twenty Third Revised Edition,Vikas Publishing House Pvt Ltd,2013.
2. M.C.Shukla, S.S.Gulshan,"*Statistics",* Second Revised Edition, S.Chand &Company Pvt Ltd, 1975.

E-references:

1. http://abyss.uoregon.edu/~js/glossary/correlation.html
2. https://www.thoughtco.com/what-is-statistics-3126367
3. https://explorable.com/course/statistics-beginners-guide
4. https://www.spss-tutorials.com/basics/

Mapping with Programme Specific Outcomes

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

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

Programme Code:	BCA	Programme Title:	Computer Applications	
Course Code:	21UACAP2	Course Title:	Batch:	2021
Total Hours:	60	Programming Lab - II: (C) (Common for CS, BCA, IT, CT)	Semester:	II
			Credits:	2.0

Course Objective

The course aims

- To provide a comprehensive study of the procedure oriented concept using C programming language.
- To facilitates the students to elaborately study about C programming techniques.
- To implement these techniques to solve the variety of real-time problems.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	CO1	Remember basic data types, operators and to write simple programs using them.
K1, K2, K5	CO2	Understand the conditional statements & loops for creating programs.
K1, K2, K3, K5	CO3	Apply the concept of arrays & functions and design the application programs.
K1, K2, K3, K4, K5	CO4	Analyze the usage of structures, pointers and use them efficiently to solve problems.
K3, K4, K5	CO5	Evaluate the file operations and write programs to handle the data using file concept.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 -** Evaluate

SYLLABUS
1. Write a C program to calculate the sum of digits of a given number. 2. Write a C program to find a factorial for given number. 3. Write a C program to print the Fibonacci series.
4. Write a C program to find the Ramanujam number. 5. Write a C program to print the numbers between some interval which divisible by four.
6. Write a C program to find the Maximum and Minimum value in a array. 7. Write a C program to sort a given number. 8. Write a C program to add two matrices. 9. Write a C program for converting numbers into words.
10. Write a C program to find and count number of vowels in a word or string. 11. Write a C program for sorting string in a alphabetical order. 12. Write a C program to find the roots of a Quadratic Equation.
13. Write a C program for swapping two values using pointers. 14. Write a C program to print Electricity Bill using File. 15. Write a C program to Maintain Student Mark List using Structure.

Text Book:

1. E. Balagurusamy, "*Programming In Ansi C*", Second Edition, Tata Mcgraw Hill Publications, 2003.

Reference Books:

1. Ashok N. Kamthane, "*Programming in C",* Second Edition, Pearson, 2006.
2. Herbert Schildt, *"C: The Complete Reference*", Fourth Edition, Tata Mcgraw-Hill, 2008.
3. Shubhnandan S, Jamual, "*Programming in C*", First Edition, Pearson, 2014.
4. Subburaj R, "*Programming in C",* First Edition, Vikas Publishing, 2012.

E-references:

1. https://www.cprogramming.com/reference/
2. https://en.cppreference.com/w/c/language
3. https://developerinsider.co/best-c-programming-book-for-beginners/

Mapping with Programme Specific Outcomes

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

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

Question Paper Pattern

(Common for Major, Allied, Allied Optional and Major Optional Papers)

For EOS Examinations: 50 Marks

The Question Paper is to be divided into THREE Sections.

Section-A Carries 10 Marks, Section-B Carries 15 Marks and Section-C Carries 25 Marks.

Section-A Contains 10 Multiple Choice Questions. (10 x 1 = 10)

Two Questions from each unit. (Q. No: 1 to 10)

Section-B Contains 5 Either or Choice Questions. (5 x 3 = 15)

Each Question carries 3 Marks. Both (a) and (b) from the same unit with no sub division. Q. No.: 11 (a) or (b) to 15 (a) or (b)

Section-C Contains 5 Either or Choice Questions. (5 x 5 = 25)

Each Question carries 5 Marks. Both (a) and (b) from the same unit with no sub division. Q. No.: 16 (a) or (b) to 20 (a) or (b)

For CIA Examinations: 30 Marks

CIA Test I and II Question Paper Pattern: (30 Marks)

Section-A: 8 Multiple Choice Questions. (8 x 1 = 8)

Section-B: Four Questions with internal choice (Either or Choice) (4 × 3 = 12)

Section-C: Two Questions with internal choice (Either or Choice) (2 × 5 = 10)

Components of Continuous Internal Assessment (CIA)

Components	**Allotment of Internal Assessment Marks for a Maximum of 50 Marks**
Two Tests (30+30=60/4)	15
Model Exam (50 Marks)	20
Assignment	05
Quiz / Term Paper / Composition / Field Visit / Industrial Visit / GD etc.	05
Attendance	05
CIA Total	**50**