I B.C.A	PROGRAMMING IN C	CA101S
SEMESTER - I		HRS/WK- 4
CORE-1		CREDIT - 4

UNIT-I **[12 Hrs]**

C Fundamentals: Character set – Identifiers - keywords - Data types-Constants –Variables –Declarations – Expressions - Statements-Operators - Library functions.

UNIT-II **[12 Hrs]**

Control Statements: Data Input/Output functions - Simple C programs - flow of control-control structures - switch, break and continue - Go to statement-comma operator.

UNIT-III **[12Hrs]**

Functions: Defining, accessing functions - functions prototypes-passing arguments - call by value - call by reference - Recursions-storage classes.

UNIT-IV **[12Hrs]**

Arrays: Defining and processing – passing arrays of functions- Arrays and string – Structures - passing structures to functions - self-referential structures - unions.

UNIT-V **[12Hrs]**

Pointers: Declarations - passing pointers to functions - operation with pointers - pointer and arrays - arrays of pointers - structure and pointers – Files and its operations.

TEXT BOOK:

1. E. Balagurusamy -Programming in ANSI C -Tata McGraw Hill Pub.

REFERENCE BOOKS:

1. Byron S. Gottfied - Schaum's outline Theory and problems of programming with C. Tata McGraw Hill Pub.
2. YeshwanthKanethkar -Let us C, BPB Publications.
3. K. R. Venugopal, S. R. Prasad -Mastering C – Tata McGraw Hill Pub.

I B.C.A	DIGITAL LOGIC FUNDAMENTALS	CA102T
SEMESTER - I		HRS/WK- 5
CORE-2		CREDIT - 4

UNIT-I **[15 Hrs]**

Number System: Number system and its conversions. The Basic Gates - Universal Gates - Boolean Algebra - Boolean Laws and Theorem.

UNIT-II **[15 Hrs]**

Simplification: Sum of products - Product of Sums - K-map simplifications (2,3 and 4 variables) - Don't care conditions-QuineMcclausky tabulation method (2,3 and 4 variables).

UNIT-III **[15 Hrs]**

Combinational Arithmetic Circuits: Adder – Half Adder – Full Adder –Binary Parallel Adder-Design Full adder using only half adders- Subtractor – Half Subtractor – Full Subtractor -BCD Adder.

UNIT-IV **[15 Hrs]**

Combinational Logic Circuits: Multiplexers (2x1 Multiplexer, 4x1 Multiplexer , 8x1 multiplexer) – Demultiplexers (1 x 2 Demultiplexer, 1 x 4 Demultiplexer, 1 x 8 Demultiplexer)-Decoders(3 to 8 line decoder, 4 to 16 line decoder) –Encoders(8 to 3 line encoder, 16 to 4 line encoder)

UNIT-V **[15 Hrs]**

Sequential Logic Circuit: Flip-Flops - Its types - RS Flip flop, JK Flip flop, D Flip flop, T and Master Slave. Shift Registers and its types(SISO,SIPO,PISO,PIPO registers). Counters - Asynchronous counter (Binary Ripple Counter, BCD Ripple Counter) - Synchronous Counter (Binary up counter, Binary down counter, Binary Up/Down counter).

TEXT BOOK:

1. M. Morris Mano -Digital Logic and Computer Design- PHI.

REFERENCE BOOKS:

1. Thomas C. Bartee Digital ComputerFundamentals- McGraw Hill Pub.
2. Malvino& Leach- Digital Principles and Applications –McGraw Hill Pub.
3. S. Ramalatha - Digital Computer Fundamentals, Meenakshi Agency.

I B.C.A	OBJECT ORIENTED PROGRAMMING USING C++	CA203Q
SEMESTER - II		HRS/WK- 5
CORE - 4		CREDIT - 4

UNIT-I **[15 Hrs]**

C++ fundamentals: Introduction to C++: Tokens, Keywords, Identifiers, Variables, Operators, Expressions and Control Structures-Arrays in C++ - CIN-COUT.

Unit-II **[15 Hrs]**

Principles of Object Oriented Programming(OOP): Evolution of C++ - Programming Paradigms – Key Concepts of OOP – Advantages of OOP – Usage of OOP and C++.

UNIT-III **[15Hrs]**

OOPS Fundamentals: Classes and Objects: Constructors and Destructors; and Type of Constructors – Inheritance: Single Inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical Inheritance – Hybrid Inheritance.

UNIT-IV **[15 Hrs]**

Functions: Inline Functions – Friend Function-Virtual Function-**Polymorphism:** Function Overloading - Operator Overloading.

Input and Output in C++ - Streams-Stream classes- Formatted and Unformatted console I/O operations-Member functions of istream class-manipulators-manipulators with parameters

UNIT-V **[15 Hrs]**

Working with Files: Classes for File Stream Operations – Opening and Closing a File – End-of-File Detection – File Pointers – Updating a File – Error Handling during File Operations – Command-line Arguments.

TEXT BOOK:

1. E. Balagurusamy-Object Oriented Programming with C++.TMH-1995

REFERENCE BOOKS:

1. H. Schildt, C++: The Complete Reference,TMH-1998
2. Robert Lafore, Object Oriented Programming in Microsoft C++, Galgotia Publication.
3. Ashok N. Kamthane, Object Oriented Programming with ANSI & Turbo C++, Pearson Education, 2006.

II B.C.A	COMPUTER ALGORITHMS	CA306A
SEMESTER - III		HRS/WK-6
CORE - 8		CREDIT-4

UNIT-I: **[18Hrs]**

Introduction: Algorithm-Pseudocode-Time complexity - Space complexity-best case,worst case and average case analysis- asymptotic notations: Big Oh,BigOmega,theta,smallOh,small Omega.

UNIT-II : **[18 Hrs]**

Divide and Conquer: General method- Complexity analysis-Binary search algorithm-Finding Maximum and minimum - Merge sort –Quick sort - Strassen's Matrix Multiplication

UNIT-III: **[18 Hrs]**

Greedy method: General method- Knapsack problem–Prim's Algorithm - Kruskal's Algorithm- single source shortest path algorithm

UNIT-IV : **[18 Hrs]**

Dynamic Programming: General method-definition: principle of optimality-applications of dynamic programming -multistage graph: forward approach, backward approach-Traveling salesman problem.

UNIT-V : **[18 Hrs]**

Graph algorthims:-Depth first search- Breadth first search-applications of graph traversals-comparison between DFS and BFS-Connected components –Biconnected components.

TEXT BOOKS:

1. E. Horowitz, S. Sahni and S. Rajasekaran, Computer Algorithms Galgotia-1999.
2. Anuradha and A.Puntambekar,Analysis and Design of Algorthims-Technical Publications(page no-1-3 to1-10, 2-1 to2-8, 5-1to5-23)
3. A. Puntambekar, Design and Analysis of Algorthims-Technical Publications Pune(page no:4-1 to4-5, 4-34 to4-36, 6-6 to6-38)

REFERENCE BOOKS:

1. G. Brassard and Brately- Fundamentals of Algorithmics, PHI 1996.
2. Goodman S.E. and Hedetniemi S.T. - Introduction to the Design and Analysis of Algorithms - Tata McGraw Hill publication

III B.C.A	DATA COMMUNICATION NETWORKS	ECA511
SEMESTER - V		HRS/WK-5
DSE - I (3)		CREDIT - 4

UNIT -I **[15 hrs]**

Introduction: Networks – protocols and standard – line configuration – topology – transmission mode – categories of networks – inter networks.

UNIT -II **[15 hrs]**

OSI model: functions of the layers – TCP/IP protocol suite – signals – analog and digital signal – periodic and a periodic signals – analog signals – digital signal – data transmission – data terminal equipment – data circuit terminals equipment – modems.

UNIT -III **[15 hrs]**

Transmission media: guided media – unguided media – transmission impairments – media comparison. Multiplexing – FDM – TDM – WDM. Error detection and correction – types of errors–detection – vertical redundancy check (VRC) – longitudinal redundancy check (LRC) – cyclic redundancy check (CRC) – check sum – error correction.

UNIT -IV **[15 hrs]**

Switching Techniques: circuit switching – packet switching – message switching – networking and internetworking devices – repeaters – bridges – routers – gateways.

UNIT -V **[15 hrs]**

Routing algorithms: distance vector routing – link state routing – data link control – line discipline – flow control – error control.

TEXT BOOK:

1. Behrouz A Forouzan, Data Communications and Networks, Second Edition, McGraw Hill, 2002.

REFERENCE BOOKS:

1. William Stallings, Data & Computer Communications, Sixth Edition, Pearson Education, 2001.
2. Andrew S. Tanenbaum, Computer Networks, Pearson Education, 3rd Edition.
3. Fred Halsall, Data Communications, Computer Networks and Open Systems, Addison Wessley, 1995.

III B.C.A	ORGANIZATIONAL BEHAVIOR	19GCA52A
SEMESTER - V		HRS/WK-5
GE-I (1)		CREDIT-4

UNIT- I **[15 Hrs]**

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR : Definition-Key Elements of OB-Need for studying OB-Contributing Disciplines to OB-Challenges faced by the Management-OB Frame work – OB models.

UNIT-II **[15 Hrs]**

INDIVIDUAL BEHAVIOUR: Introduction to Personality –Determinants of Personality-Personality Types –Theories of Personality-Perceptual Process-Factors affecting Perception-Job Satisfaction-Determinants of Job Satisfaction-MotivationProcess -Need for Motivation-Maslow's Need Hierarchy Theory of Motivation.

UNIT- III **[15 Hrs]**

GROUP BEHAVIOUR: Definition andCharacteristics of Group-Need for people to form and join Group-Types of Group-Stages of Group Development-Team Building-Types of Team-Team Building Process.

UNIT - IV **[15 Hrs]**

COMMUNICATION: Introduction-Nature and Need for Communication-Process of Communication-Channels of Communication-Barriers to Communication

LEADERSHIP: Meaning-Functions of Leadership-Leadership Styles-Factors determining Effective Leadership-Leadership Theories - Transactional and Transformational Leadership.

UNIT -V **[15 Hrs]**

CONFLICTS: Introduction - Sources of Conflicts – Types of Conflicts – Conflict Management

STRESS: Introduction - Sources of Stress – Consequences of Stress.

ORGANIZATIONAL CLIMATE: Definition-Dimensions of Organizational Climate - Determinants of Organizational Climate

ORGANIZATIONAL CULTURE: Organizational Culture: Definition and Characteristics - Types of Culture.

TEXT BOOK:

1. Dr. S.S. Khanka, Organizational Behaviour, S.Chand Publication, 4th Revised Edition

REFERENCE BOOKS:

1. Stephen P. Robins, Organisational Behavior, PHI Learning / Pearson Education, 11th edition, 2008.
2. Fred Luthans, Organisational Behavior, McGraw Hill, 11th Edition, 2001.

III B.C.A	ENTREPRENEURIAL DEVELOPMENT	19GCA52B
SEMESTER V		HRS/WK – 5
GE – I (2)		CREDIT - 4

UNIT-I **[15 Hrs]**

Introduction: Entrepreneurship: Meaning- Nature-Importance-Theories-Entrepreneur: Meaning-Definition-Characteristics-Qualities-Types and roles of Entrepreneur-Entrepreneur vsIntrapreneur - Factors promoting an Entrepreneur-Role of Entrepreneurs in India's Economic Development.

UNIT-II : **[15 Hrs]**

Rural Entrepreneurship and Agri-Preneurship: Rural Entrepreneurship**:** Meaning -Need - Problems of Rural Entrepreneurship- Developing Rural Entrepreneurship-NGOs and Rural Entrepreneurship.

Agri-Preneurship**:** Introduction-Need for Developing Agri-preneurship in India-Opportunities and Challenges Involved in Developing Agri-preneurship-Suggestions for Developing Agri-preneurship

UNIT-III : **[15 Hrs]**

Family Business: Meaning – Characteristics -Types - Advantages of Family Business-Disadvantages of Family Business-Major Challenges Faced by Family Business in India-Business Succession Planning-Making Family Business More Effective

UNIT-IV : **[15 Hrs]**

New Venture and MSME- An Introduction: New venture-meaning-Promoting New Venture-Sources of business Ideas-Idea Generation Techniques-Project Identification-Project selection-Procedures to start a New Venture-Project: Meaning-Types-Formulation of Project Report-Project Appraisal-MSME: Introduction-Classification of Enterprises-Memorandum of MSME's-Registration of MSME's.

UNIT- V **[15 Hrs]**

Institutional Support and Subsidies: Sources of raising funds-need for institutional finance-various Institutions Supporting entrepreneurship. Incentives and Subsidies: Meaning, needs, incentives and subsidies is available for entrepreneur- District Industries Centre (DIC) - Industrial Estates.

TEXT BOOK:

1. Entrepreneurial Development, Dr .S.S. Khanka, S. Chand Publications-2018.

REFERENCE BOOKS:

1. Vasant Desai, Small-Scale Industries and Entrepreneurship, Himalaya Publishing House, 2017
2. C B Gupta &Srinivasan : Entrepreneurship Development in India, Sultan Chand.
   A Gupta : Indian Entrepreneurial Culture, New Age International.

III B.C.A	OPERATING SYSTEMS	CA615A
SEMESTER - VI		HRS/WK-6
CORE- 14		CREDIT - 4

UNIT-I **[18 hrs]**

Introduction: History of Operating system - Operating system functions –Definition of Operating System–Different services of the operating system –Uses of System Calls –User's view of the operating system –The Macro Facility –GUI –The Kernel –Booting– Information Management (IM) –File system– Disk space allocation method–Directory structure.

UNIT-II **[18 hrs]**

Process Management: Inter-process communication - Dead Lock - Dead Lock prerequisites - Dead Lock Strategies

UNIT-III **[18 hrs]**

Memory Management: - Single Contiguous – Fixed Partitioned – Variable Partitions – Non-Contiguous allocations - Paging – Segmentation - Virtual Memory Management Systems.

UNIT-IV **[18 hrs]**

GUI: – Components of GUI – Requirements of Windows based GUI –Security Protection: Threats – Attacks – Worms – Virus - Design principles – Authentication – Protection mechanisms – Encryption.

UNIT-V **[18 hrs]**

Unix OS: Overview of Unix-Unix File System: Users View of File System-Types of Files-Internals of File System: Logical Layout of the File-The Super Block-Structure of inode-Address Translation-run-Time Data Structure for File system: UFDT-File Table-Inode Table-System Calls: Open-Read-Write-Random Seek-Close-Create a File-Unlink a File-Change Directory. Basic Commands in Unix.

TEXT BOOK:

1. A. S. Godbole, Operating Systems, Tata McGraw Hill, 1999.

REFERENCE BOOK:

1. A. Silberschatz and P. B. Galvin- Operating system concepts, Addision-Wesley Publishing company, Fifth Edition, 1998.
2. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education India.

III B.C.A	SOFTWARE ENGINEERING	ECA616T
SEMESTER - VI		HRS/WK-5
DSE - II (1)		CREDIT - 4

UNIT - I **[15 hrs]**

Introduction: Evolving Role of Software-Characteristics of Software-Software Myths-Process Models: Waterfall Model- Evolutionary Process Models.

UNIT –II **[15 hrs]**

Requirement Engineering: Tasks - Initiating the Requirements Engineering Process-Eliciting Requirements.

UNIT III **[15 hrs]**

Building Analysis Model: Requirement Analysis - Data Modeling – Flow Oriented Modeling – Class Based Modeling – Creating a Behavioral Model.

UNIT –IV **[15 hrs]**

Testing: Software Testing Methods - Software Testing strategies –White Box Testing – Basic Path- Control Structure – Black Box Testing.

UNIT –V **[15 hrs]**

Project Management: Management Spectrum - Formal Technical Reviews – Software Change Management Process – Clean Room S/W Engineering Specification-Design and Testing.

TEXT BOOK:

1. R. S. Pressman, Software Engineering, Sixth Edition, Tata McGraw Hill International Edition – 1997.

REFERENCE BOOKS:

1. Richard Fairley, Software Engineering (Design, Reliability and Management), Tata McGraw Hill edition, 1983.
2. Carlo Ghezzi, Mehdi Jazayasi, Dino Mandrioloi, Fundamentals of Software Engineering, PHI Pvt. Ltd., 1991.

B.C.A	MAIN PROJECT	JCA601
SEMESTER - VI		HRS/WK-3
MAIN PROJECT		CREDIT – 3

About the Project:

- The students will carry out a project for a period of six months and is expected to do planning, analysing, designing, coding and implementation of the project.
- The initiation of project should be with the project proposal.
- The synopsis approval will be given by the project guides.
- Review meeting will be conducted periodically by the project guides.
- Project will be evaluated by the external examiners through viva-voce.

Problem:

- Develop a project by choosing any topic in the techniques already learnt during the complete course or that is relevant to the market needs.

FORMAT FOR PREPARING MAIN PROJECT REPORT

Arrangement of contents

1. Title Page
2. Bonafide Certificate
3. Acknowledgement
4. Table of contents
5. Abstract
6. Chapters of the Report
7. References
8. Appendices, if any

Appendices should be named as

APPENDIX – A
APPENDIX - B

BINDING SPECIFICATION

- Report should be found using flexible cover of thick white art paper.
- The Spine for the bound volume should be of black calio of 2cms width.
- The Cover should be printed in block letters.

MARGIN SPECIFICATION

Top	:	4 cms
Bottom	:	3 cms
Left	:	4.5 cms
Top	:	2.5 cms

PAGE NUMBERING

All Page numbers should be typed without punctuation on the bottom-center portion of the page. The Preliminary pages (table of contents and abstract) should be numbered in lowercase roman literals. Papers of main text, starting with Chapter-1, should be consecutively numbered using Arabic numerals.

THEMES/CONTENT AREAS

Students are encouraged to select any real time project at any IT concern with the following themes that are relevant to the current IT market needs.

1. Android applications
2. Web applications
1. Cloud computing
2. Artificial Intelligence
3. Internet Of Things
4. Animation projects
5. Standalone projects using C#, C, C++, JAVA, Python, R programming etc…