Shree Govind Guru University

CURRICULAM AND CREDIT FRAMEWORK FOR BCA 4th

SEMESTER PROGRAMMES

AS PER THE NEP 2020

Shri Govind Guru University
Course Structure under NEP-2020
BCA – Semester-IV

Subject		Code	Subject Title	Theory	Practical	Credits	Marking Scheme		
							Internal	External	Total
Discipline Specific Course Core (Major)	Major-8		Core Java	3	1	4	50	50	100
	Major-9		Relational Database Management Systems – II	3	1	4	50	50	100
	Major-10		System Analysis and Design	4	0	4	50	50	100
	Minor-3		Software Engineering	4	0	4	50	50	100
Ability Enhancement Course	AEC-4		Life Skills	2	0	2	25	25	50
Skill Enhancement Course	SEC-4		E-Commerce-II	2	0	2	25	25	50
Value-Added Course	VAC-4		Environment Studies - II	2	0	2	25	25	50
			Total			**22**			

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 4								
TITLE OF THE COURSE: Core Java								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		MAJOR-8	4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	• Java Introduction o Creating first java classes o Introduction to Object Oriented Programming Concept o Learning about Java o Features of Java o Analyzing a java application that uses console output o Saving, compiling and running a java application • Using data within java programs o Constants o Literals o variables o Keywords o Identifiers • Data Types in Java • Understanding numeric type conversion • Operators in Java • Using methods, classes and objects o Creating methods with zero, one and multiple arguments o Class concepts and creating a class o Creating instance methods in a class o Declaring objects and using their methods o Static method o Understanding block and scope o Method overloading o Constructors o Sending arguments to constructors o Constructors overloading o 'this' keyword o Static variable o Working with constants • Flow Control Statements o o if and if…..else ,Nesting if… else o Using logical AND and OR operators o switch statement Using the conditional AND not operators • Looping o while loop o Using the arithmetic operators	11+7

	○ for loop ○ do…. while loop Nested loops	
2.	• Manipulating characters class isUpprCase(), toUpperCase(), isLowerCase(), toLowerCase() isDigit(), isLetter(), isLetterOrDigit(), isWhitespace() • Manipulating String class • Declaring a String Object • Comparing String values toUpperCase() , toLowerCase() ,length(), indexOf(), charAt(), endswith() startWith() ,replace(), toString() • Manipulating StringBuffer class setLength(), capacity(), append(), insert(),setChartAt(), charAt() • Arrays ○ Declaring and initializing an array ○ Using subscripts with an array ○ Passing array to methods ○ Creating arrays of strings ○ Using two-dimensional and multidimensional arrays ○ Arrays class binarySearch(), equals(), fill(), sort() methods of Array Class.	11+7
3.	• Excepting Handing ○ Learning about exceptions ○ Understanding the limitations of traditional error handling ○ Trying code and catching exceptions ○ Throwing and catching multiple exceptions ○ 'finally' block ○ Understanding the advantages of exception handling ○ Checked and unchecked exception ○ Creating own exceptions (custom exception) • Inheritance ○ Concept of inheritance ○ Extending classes ○ Method overriding ○ Constructor calling during inheritance ○ Super class constructor that require arguments (using 'super' keyword) Accessing super class methods (using 'super' keyword) • Method which cannot be override ○ 'final' method ○ 'final' super class Static method	11+7

4.	• Interfaces and Abstract Classes o Defining Abstract class o Using Abstract class o Defining Interfaces o Implementing Interfaces o Multiple inheritance using Interfaces • Packages o Define a Package o Creating a Package o Class and package o Import statement o Importing a Package o Access Protection (Access modifiers) • Applets o Introduction o Lifecycle of an Applet o Comparing Applets and Application o Creating Applets o Parameters passing in applet	12+9
	Total Lectures	**75**

Reference Book:

1.JAVA for Beginners by Joyce Farrell, Cengage Learning
2.Object Oriented Programming in java by Dr. G.T.Thampi , Dreamtech
3.JAVA Programming by Hari Mohan Pandey, Pearson

BACHELOROFCOMPUTERAPPLICATIONS(B.C.A.)SEMESTER–4								
TITLE OF THE COURSE: Relational Database Management System-II								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		MAJOR 9	4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Introduction to SQL** ○ Data Definition Commands ○ Data Types ○ Creating Table Structures ○ SQL Constraints ○ Data Manipulation Commands ○ Adding Table Rows ○ Saving Table Changes ○ Listing Table Rows ○ Updating Table Rows ○ Restoring Table Contents ○ Deleting Table Row ○ Select Query ○ With Conditional Restrictions ○ Arithmetic Operators ○ Logical Operators ○ Special Operators ○ Advanced Data Definition Commands ○ Changing a Column's Data Type ○ Changing a Column's Data Characteristic ○ Adding a column ○ Dropping a column ○ Advanced Data Update ○ Copying Parts of Table ○ Adding Primary and Foreign Key Designations ○ Deleting Table From The Database ○ Aggregate Functions	11+7
2.	**Business Intelligence and Data Warehouse** ○ The need for data analysis ○ Business Intelligence ○ Business Intelligence Architecture ○ Decision Support Data ○ Operational Data Vs. Decision Support Data ○ Decision Support Database Requirements ○ The Data Warehouse	11+7 6

	○ Online Analytical Processing ○ Multidimensional Data Analysis Techniques ○ Advanced Database Support ○ Easy-To-Use End-User Interface ○ Client/Server Architecture ○ Data Mining	
3.	**Distributed Database Management System** ○ Distributed Database Management Systems ○ Evolution of DDBMS ○ Distributed Processing and Distributed Database ○ DDBMS Advantages and Disadvantages ○ Characteristics of DDBMS ○ Components of DDBMS ○ Levels of Data and Process Distribution ○ Single-Site Processing, Single-Site Data(SPSD) ○ Multiple-Site Processing, Single-Site Data(MPSD) ○ Multiple-Site Processing, Multiple-Site Data(MPSD) ○ Distributed Database Transparency Features ○ Distributed Transparency ○ Transaction Transparency ○ Distributed Requests and Distributed Transactions ○ Distributed Concurrency Control ○ Two-Phase Commit Protocol ○ Performance Transparency and Query Optimization	11+7
4.	**Advanced SQL** ○ Set Operators ○ Union ○ Union All ○ Intersect ○ Minus ○ SQL Join ○ Cross Join ○ Natural Join ○ Join Using Clause ○ Join On Clause ○ Outer Join	12+9
	Total Lectures	**45+30**

Reference Books

1.Introduction to Database Management Systems by ISRD Group, Tata McGraw-Hill
2.An Introduction to Database Systems, by C. J. Date, A. Kannan & S. Swamynathan, Pearson

BACHELOROFCOMPUTERAPPLICATIONS(B.C.A.)SEMESTER–4								
TITLE OF THE COURSE: Information and System Analysis and Design								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		MAJOR 10	4	60	0	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Introduction System Analysis and Design** Software Development Models ○ Waterfall Model ○ The Incremental Model ○ The Spiral Model Overview Feasibility Study ○ Operational Feasibility ○ Technical Feasibility ○ Economic Feasibility ○ Schedule Feasibility Requirement Modeling / Fact-finding techniques ○ Interview ○ Document review Data and Process Modeling ○ Data Flow Diagram: Concepts, Symbols, Rules, Construction of DFD ○ for any Case Study ○ Data Dictionary: Concepts, Rules, Construction of Data Dictionary ○ for any Case Study	15
2.	**Object Oriented Analysis & Design Structures Object-Oriented Modeling:** Object-Oriented Modeling: ○ Analysis Model ○ Architecture Model ○ Component Design Model Object-Oriented Approach: ○ Object-Oriented Analysis ○ Object-Oriented Design The Constituents of OOAD: ○ Objects and Classes ○ Links and Association ○ Generalization and Specialization ○ Aggregation and Composition Pillars of Object-Oriented Analysis and Design ○ Abstraction ○ Encapsulation ○ Inheritance	15

	○ Polymorphism ○ Coupling ○ Cohesion ○ Components ○ Interfaces The Language of OOAD – Unified Modeling Language: ○ UML Diagrams	
3.	**Use Case Diagram, Class Diagram and Object Diagram:-** ○ Scope of Use-Case Diagram ○ Benefits of Use-Case Diagram Elements of Use-Case Diagram: ○ Actors ○ Use-Cases ○ Relationship between Actor and Use Case ○ Relationship between Use-Cases ○ Relationship between Actors ○ Guidelines for design of Use-Case Diagram ○ Draw the Use-Case diagram for any Case study Class Diagram: ○ Analysis and Design version of Class Diagram ○ Elements of Class Diagram ○ Guidelines for design of Class Diagram Object Diagram ○ Elements of Object Diagram: □□Objects □□Links ○ Guidelines for design of Object Diagram ○ Draw the Class and Object Diagram for any Case Study	15
4.	**Sequence Diagram, Activity Diagram &State Chart Diagram.** Sequence Diagram: ○ Introduction ○ Elements of Sequence Diagram: □□Life Lines □□Messages □□Activation □□Guards □□Combined Fragments ○ Guidelines for design of Sequence Diagram ○ Draw the Sequence Diagram for any case study Activity Diagram: ○ Introduction ○ Elements of Activity Diagram: ○ Initial State ○ Final State ○ Action / Activity ○ Transitions ○ Decision ○ Synchronization, Fork and Join ○ Swimlanes ○ Object and Object Flow ○ Guidelines for design of Sequence Diagram ○ Draw the Sequence Diagram for any case study	15 9

	State Chart Diagram: o Introduction o Elements of State Chart Diagram: o Initial State o Final State o Transitions o Guidelines for design of State Chart Diagram o Draw the State Chart Diagram for any case study	
	Total Lectures	**60**

Reference Books:

1. Magnifying Object-Oriented Analysis and Design by Arpita Gopal and Netra Patil, PHI
2. System Analysis and Design Methods by Gary B. Shelly, Thomas J. Cashman, Harry J. Rosenblatt, Cengage Learling

BACHELOROFCOMPUTERAPPLICATIONS(B.C.A.)SEMESTER–4								
TITLE OF THE COURSE: Introduction to Software Engineering								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		MINOR-3	4	60	0	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	Introduction: Definition, need, software engineering methods, Tools, and procedures, Software Process: Software Engineering layers, SEI-CMM, process framework, Development Lifecycle models: Waterfall, spiral, iterative, enhancement and phased development, RAD model, Component based development model, Prototyping model. Overview, various phases, analysis, design, development and implementation. Software project planning :Overview, objectives, scope, resources	15
2.	Cost Estimation Techniques: Metrics for software productivity and quality Productivity metrics: direct and indirect methods, size and function oriented metrics, Decomposition techniques: LOC and FP estimation, Effort Estimation: Overview, COCOMO, putnam, esterling models, automated Estimation tools. Configuration and Administration; virtual hosting	15
3.	Software Project Scheduling: Task definition and parallelism, effort distribution, scheduling , Methods: PERT and CPM, Software project plan outline Software prototyping : Overview, steps, methods, tools, specification, guidelines. Requirement analysis methods: introduction, methods Object oriented, data flow and data structure oriented, comparisons, application results, automated tools , Software design Methods: iterative, top-down, bottom up Design representations: flow charts, pseudo code, HIPO and techniques, Modular design: Overview, module coupling and cohesion, various types of coupling, merits and demerits, other approaches to programming.	15
4.	Software implementation: Issues, concept of programming support environment, Risk Management Software testing Overview Various tests and methods: top-down, bottom-up, Debugging: definition, techniques and strategies, exhaustive testing, classification, cyclomatic complexity, Overview, integration of hardware and software components	15
	Total Lectures	**60**

Reference Books:

1. Pressman, Roger (2010) *Software Engineering: A Practitioner's Approach*, McGraw Hill , New York, NY.
2. Sommerville, Ian (2011) *Software Engineering*, Addison-Wesley , Boston, MA.

BACHELOROFCOMPUTERAPPLICATIONS(B.C.A.)SEMESTER–4								
TITLE OF THE COURSE: LIFE SKILLS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		AEC-3	2	30	0	25	25	50

CourseContent		
Unit	**Description**	**Lectures**
1.	**RESUME SKILLS** Introduction of résumé and its importance, Difference between a CV, résumé and biodata, Essential components of a good résumé, Common errors while preparing a résumé, Prepare a good résumé considering all essential components.	10
2.	**INTERVIEW SKILLS** **Preparation and Presentation** Meaning and types of interviews (F2F, telephonic, video, etc.), Dress code, background research, do's and don'ts, Situation, task, action, and response (STAR concept) for facing an interview, Interview procedure (opening, listening skills, and closure), Important questions generally asked at a job interview (open- and close-ended questions). **Simulation & Common Errors:** Observation of exemplary interviews, Comment critically on simulated interviews, Discuss the common errors that candidates generally make at an interview, Demonstrate an ideal interview.	10
3.	**GROUP DISCUSSION SKILLS & CAREER OPPORTUNITIES** **Group Discussion Skills**: Meaning and Methods of Group Discussion, Procedure of Group Discussion, Simulation & Common Errors in Group Discussion. **Career Opportunities**: Knowing yourself — Personal characteristics, Knowledge about the world of work, requirements of jobs, including self-employment, Sources of career information, Preparing for a career based on potential and availability of opportunities.	10
	Total Lectures	**30**

Reference Books:

1. SCERT. Life Skills Education-Guidebook for Teachers (SCERT)
2. Sengararvelu,G. (2011) .Education in Emerging Indian Society, Neel Kamal Publication Pvt Ltd.
3. Shiv Khera, "You Can Win" , Macmillan Books, New York.

4. Barun K. Mitra, “Personality Development & Soft Skills”, Oxford Publishers, Third impression.
5. ICT Academy of Kerala, "Life Skills for Engineers", McGraw Hill Education (India) Private Ltd.
6. Kalyana, “Soft Skill for Managers”; First Edition; Wiley Publishing Ltd.

BACHELOROFCOMPUTERAPPLICATIONS(B.C.A.)SEMESTER–4								
TITLE OF THE COURSE: E-Commerce-II								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		SEC 4	2	30	0	25	25	50

CourseContent		
Unit	**Description**	**Lectures**
1.	**Online Security and Payment System** The E-Commerce Security Environment ○ Scope of the problem ○ What is good E-commerce security? ○ Dimensions of E-commerce security? ○ The tensions between security and other values	10
2.	Security Threats in the E-Commerce Environment ○ Malicious code ○ Unwanted programs ○ Phishing and Identity theft ○ Hacking and Cyber vandalism ○ Credit Card Fraud/Theft ○ Spoofing and Spam Web Sites ○ Sniffing ○ Insider attacks ○ Poorly designed server and client software Technology solution ○ Protecting Internet communications ○ Encryption(excluding: limitation of encryption solutions)	10
3.	Marketing on the Internet: ○ Advertising on the Internet – ○ Charting the On-Line Marketing Process ○ E-Commerce Catalogs or Directories – Information Filtering ○ Consumer Data Interface: Emerging Tools.	10
	Total Lectures	**30**

Reference Books:

1.K.C. Laudon & C.G. Traver, E-commerce, Pearson Education, 2003

2.R. Kalakota&A.B.Whiilston-' Frontiers of Electronic Commerce, Pearson Education- 2006.

3.K.K.Bajaj&D.Nag- E-Commerce, Tata McGraw Hill, New Delhi, Second Edition.

BACHELOROFCOMPUTERAPPLICATIONS(B.C.A.)SEMESTER–4								
TITLE OF THE COURSE: ENVIRONMENTAL STUDIES – 2								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		VAC 4	2	30	0	25	25	50

Course Content		
Unit	**Description**	**Lectures**
1.	**Water**: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state), Dams-benefits and problems, **Energy Resources**: Environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.	10
2.	Definition, causes, effects, and control measures of: air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, and nuclear pollution. Solid waste management: causes, effects and control measures of urban and industrial wastes, role of an individual in prevention of pollution.	10
3.	Environmental Accounting: Concept, Significance, and Types. Environmental Economics, KYOTO Protocol: Aim, Vision, and Functioning; Carbon Trading; Green Marketing, Green Finance. Environmental Ethics. Corporate Environmental Responsibility, Green Entrepreneurship.	10
	Total Lectures	**30**

Reference Books:

1. Agarwal, K.C., 2001, Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. Bharucha, E., The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India(R).
3. Brunner, R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
4. Clark, R.S., Marine Pollution, Clanderson Press Oxford (TB).
5. Cunningham, W.P., Cooper, T.H., Gorhani, E.& Hepworth, M.T., 2001, EnvironmentalEncyclopedia, Jaico Publ. House, Mumbai, 1196p.
6. De, A.K., Environmental Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment (R).
8. Jadhav, H.& Bhosale, V.M., 1995, Environmental Protection and Laws, Himalaya Pub. House,Delhi.
9. Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). Environment Reader for Universities, Centrefor Science and Environment, New Delhi.
10. Miller, T.G., Jr. Environmental Science, Wadsworth Publishing Co. (TB).