# Detailed Program Scheme

## Bachelor of Computer Applications

## (BCA)

## Semester-IV

## (2016-2019)

DOC201712080016

RNB GLOBAL UNIVERSITY

Educating stars for tomorrow


**RNB GLOBAL UNIVERSITY**

RNB Global City, Ganganagar Road,
Bikaner, Rajasthan 334601

## OVERVIEW

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd(July-December) and Even (January-June).**Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for BCA Program for (January- June) Even Semester, 2018 along with examination pattern is as follows:

### Course Scheme

***Semester IV***

| S. No | Course Code | Course Name | Credits |
|---|---|---|---|
| 1. | 13010200 | Java Programming Language | 3 |
| 2. | 13010300 | Java Programming Language Lab | 1 |
| 3. | 13010600 | Computer Networks | 4 |
| 4. | 13010700 | Computer Networks Lab | 1 |
| 5. | 13010400 | Computer Graphics | 3 |
| 6. | 13010500 | Computer Graphics Lab | 1 |
| 7. | 13011000 | Optimization Technique | 4 |
| 8. | 13011100 | Software Engineering | 4 |
| 9. | 13010800 | Web Technology | 3 |
| 10. | 13010900 | Web Technology Lab | 1 |
| 11. | 13003000 | Ability & Skill Enhancement Module - IV | 3 |
| 12. | 99002000 | NCC/NSS/Other Similar activities | - |
| 13. | 99002100 | Club activities | - |
| **Total Credits** | | | **28** |

## EVALUATION SCHEME- THEORY

The evaluation of the theory paper of BCA would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

**Internal Assessment**

| Area of Assessment | Marking | Maximum Marks |
|---|---|---|
| Sessional-I | As per marks obtained | 10 |
| Sessional-II | As per marks obtained | 10 |
| Assignment + Presentation | 15 | 15 |
| Overall Conduct and Discipline | To be decided by concerned Faculty Member | 5 |
| Attendance | Student with 80% attendance will get 5 marks and 0.25marksforevery1% attendanceabove80% | 10 |
| **Total** | **50** | |

**External Assessment**

| Type | Marks |
|---|---|
| Theory | 50 |

## EVALUATION SCHEME -PRACTICAL

The evaluation of the practical paper of BCA would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

**Internal Assessment**

| Type | Details | Marks |
|---|---|---|
| Marks obtained in various manuals, practical file, participation, any model prepared, output of practical | Average of marks obtained | 35 |
| Discipline | To be decided by concerned faculty | 5 |

| | | |
|---|---|---|
| **Attendance** | 80% - 5 marks and 0.25 percent for every one percent above 80 % | 10 |
| **TOTAL** | **50** | |

**External Assessment**

| Type | Marks |
|---|---|
| Practical | 50 |

## EVALUATION SCHEME - NSS/NCC AND CLUB ACTIVITIES

1. NSS/NCC /Similar activities prescribed by University will be completed from Semester I – Semester IV. It will be evaluated internally by the respective institute. The credit for this will be given after IV$^{th}$ Semester.

2. The students have to join club/clubs with the active participation in different activities of club. The students would be continuously assessed from Semester I – Semester IV and credits and marks would be given after IV$^{th}$ Semester.

## CURRICULUM

### Course Name: Java Programming Language

### Course Code: 13010200

**Course Outline**

**Unit-I: Introduction**: Object oriented programming, characteristics of object orientated languages, classes, **Java Programming:** Introduction, Data types, access specifiers, operators, control statements, arrays. Classes: Fundamentals, objects, methods, constructors. **Inheritance:** Super class, sub class, this and super operator, method overriding, use of final, packages, abstract class, interface. **Polymorphism:** Method overloading, constructor overloading.

**Unit–II : Exception Handling:** Exception Class, built in checked and unchecked exceptions, user defined exceptions, use of try, catch, throw, throws, finally. **Multi threaded programming:** Overview, comparison with multiprocessing ,Thread class and runnable interface, life cycle, creation of single and multiple threads, thread priorities, overview of

Synchronization. **Java Library:** String handling (only main functions), String Buffer class. Elementary concepts of Input/Output :byte and character streams, System.in and System. out, print and println, reading from a file and writing in a file.

**Unit–III: Software Development using Java: Applets**: Introduction, Life cycle, creation and implementation, AWT controls: Button, Label, Text Field, Text Area, Choice lists, list, scrollbars, check boxes, Layoutmanagers, Elementary concepts of Event Handling :Delegation Event Model, Event classes and listeners, Adapter classes, Inner classes. **Swings:** Introduction and comparison with AWT controls.

**Unit–IV Networking Basics:** Socket (datagram and TCP/IP based client and server socket), factory methods, Inet Address **JDBC:** JDBC Architecture, JDBC Drivers, Connecting to the Database **Introduction to Java Servlets:** Life cycle ,Interfaces and classes in javax. servlet package(only description) Creating a simple servlet

**Suggested Readings:**


1. Patrick Naughton and Herbert Schildt, "Java-2 The Complete Reference", TMH.
2. Y. Daniel Liang, "Introduction to Java Programming, Comprehensive Version, 7/e"Pearson.
3. Krishnamoorthy R, PrabhuS ,"Internet and Java Programming", New Age Intl.
4. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, "Java Enterprise in aNutshell", O'Reilly.


## Course Name: Java Programming Language Lab

## Course Code: 13010300

**Course Outline**

1. Write a program to display "Hello World" in 'JAVA' language.
2. Implementation of input and output statements
3. Implementation of control statements.
4. Implementation of functions.
5. Implementation of single dimension, two dimension and three dimension array
6. Write a JAVA program that uses a recursive function for solving Towers of Hanoiproblem.
7. Write a JAVA program to implement the matrix ADT using a class. The operations supported by this ADT are:
    a) Reading a matrix.
    b) Addition of matrices.
    c) Printing a matrix.
    d) Subtraction of matrices.

e) Multiplication of matrices.

8. Write a JAVA program that overloads the + operator and relational operators (suitable)to perform the following operations:
   a) Concatenation of two strings.
9. b) Comparison of two strings.
10. Write JAVA programs that illustrate how the following forms of inheritance are supported:
    a) Single inheritance
    b) Multiple inheritance
    c) Multi inheritance
    d) Hierarchical inheritance

11. Write a JAVA program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class

## Course Name: Computer Networks

## Course Code: 13010600

**Course Outline**

**Unit –I: Introduction:** Motivation, OSI model, Signals and media, Bits over signals, Synchronous communication, Modulation and modems, Bandwidth, Throughput, and noise, Time division and Frequency division multiplexing, Standards.

**Unit-II Packet Transmission:** Multiplexing, Frames, Error correction techniques, LAN/WAN topologies, Shared media and media access, Bus topology, CSMA/CD, Wireless and CSMA/CA, Ethernet addressing and Wiring, hubs.

**Unit-III Other LAN technologies:** Ring topology, Token passing rings, FDDI, Star topologies, Asynchronous transfer mode, IEEE 802.3, 802.5.

**Routing Algorithms:** Distance-Vector, Link-State, Shortest path computation, Dijkstra's algorithm, WAN technologies including frame relay, X.25, and ATM.

**Unit-IV Internet working:** Motivation, Concept, Goals, IP addressing, Address binding with ARP, IP Datagram, Encapsulation IP fragmentation and reassembly, ICMP, TCP, UDP concept and datagrams, **Network Services:** Electronic mail, File transfer, Remote login-introduction to protocol specification, Validation and testing.

**Suggested Readings:**


1. Forouzan, B.A., Data communication and Networking, McGraw Hill (2006) 4th ed.
2. Tanenbaum, A.S., Computer Networks, Prentice Hall (2003) 4th ed.
3. Comer, D.E., Internetworking with TCP/IP Vol. 1 Principles, Portals and Architecture, Prentice Hall of India (2005) 5th ed.

4. Stallings, W., Computer Networking with Internet Protocols and Tech., Prentice Hall of India (2007).

## Course Name: Computer Networks Lab

## Course Code: 13010700

**Course Outline**

**List of Experiments**

1. Study of different Network cables and practically implement the cross-wired cable and straight through wire using clamping tool.
2. Study Network tools and basic devices.
3. Study of Network IP addressing.
4. To study about different physical equipment's used for networking.
5. To study different internetworking devices in a computer network.
6. Aim: To study the working of Basic Networking Commands.
7. To assign IP address to the PC connected to the internet.
8. To connect the computers in Local Area Network.

## Course Name: Computer Graphics

## Course Code: 13010400

**Course Outline**

**Unit-I :Introduction:** The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

**Unit-II: Hardcopy** Technologies, Display Technologies, Raster-Scan Display System, Video Controller, Random-Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc, **Clipping** Southland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm.

**Unit-III: Geometrical Transformation** 2D Transformation, Homogeneous Coordinates and Matrix Representation of 2D Transformations, composition of 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.

**Unit-IV:** Introductory Concepts: Multimedia Definition, CD-ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions),

Uses of Multimedia, Introduction to making multimedia – The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage

**Suggested Readings:**


1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice,2000.
2. D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment& Frame work , 2000
3. Ralf Skinmeiz and KlanaNaharstedt, Multimedia: computing, Communication and Applications, Pearson, 2001
4. D.Harn& Baker. Computer Graphics Prentice Hall of India,1986


## Course Name: Computer Graphics Lab

## Course Code: 13010500

**Course Outline**

1. Students are required to understand the graphics library available in Compiler and other graphical software
2. Preliminary study of Open GL, Open CV
3. To make small program of graphics using C, JAVA

## Course Name: Optimization Technique

## Course Code: 13011000

**Course Outline**

**Unit-I :Linear programming** Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

**Unit-II Queuing Theory** Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models(Model-I, Model-II).

**Unit-III Inventory Theory -** Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

**Unit-IV Job Sequencing -**Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines.

**Suggested Readings :**


1. Gillet B.E. "Introduction to Operation Research"
2. Taha,H.A. "Operation Research - an introduction"
3. KantiSwarup "Operation Research"


## Course Name: Web Technology

## Course Code: 13010800

**Course Outline**

**Unit–I :**History of the Internet and World Wide Web, Search Engines, News-group, E-mail and its Protocols, Web Portal, Browsers and their versions, Its functions, URLs, web sites, Domainnames, Portals. Static Web Development: HTML - Introduction to HTML, HTML Document structure tags, HTML comments, Text formatting, inserting special characters,

anchor tag, adding images and Sound, lists types of lists, tables, frames and floating frames, Developing Forms, Image maps.

**Unit–II:** Introduction to Java Script: Data Types, Control Statements, operators, Built in and User Defined Functions, Objects in Java Script, Handling Events.CASEading Style Sheet: Types of Style Sheets – Internal, inline and External style sheets, creating styles, link tag.

**Unit–III:** DHTML : Introduction to DHTML, Java Script& DHTML, Document Object Model, Filters, and Transitions, DHTML Events, Dynamically change style to HTML Documents.

**Unit–IV:** Introduction to WYSIWYG Design tools, Introduction to Dreamweaver, Website Creation and maintenance, Web Hosting and Publishing Concepts, XML: Introduction to XML-Mark up languages, Features of Mark up languages, XML Naming rules, Building block of XML Document, Difference between HTML & XML Components of XML, XML Parser, DTD's Using XML with HTML and CSS

**Suggested Readings:**


1. The complete reference HTML, by Thomas A powell, TMH publication.
2. Mastering HTML 4.0 by Deborah S. Ray and Erich J. Ray. BPB Publication.
3. Internet and World Wide Web Deitel HM, Deitel ,Goldberg , Third Edition
4. HTML Black Book , Stephen Holzner, Wiley Dreamtech.
5. Rajkamal, "Web Technology", Tata McGraw-Hill, 2001.
6. Jeffrey C. Jackson, "Web Technologies : A Computer Science Perspective", Pearson.


## Course Name: Web Technology Lab

## Course Code: 13010900

**Course Outline**

1. Students are to develop individual web pages, which should includes, picture, audio, running text
2. Students are also supposed to work and learn about various CMS available, hands on practice in front page/Web Publishing of MS Office

## Course Name: Software Engineering

## Course Code: 13011100

**Course Outline:**

**Unit I: Introduction:** Introduction to Software Engineering, importance of Software, The Software Evolution, Software Characteristics, Software Applications, Software Crisis: Problem and Causes .**Software Development Life Cycle:** Waterfall model, Incremental and Evolutionary process models, Personal Software process (PSP) and Team Software process (TSP), Overview of agile process and aspect oriented programming

**Unit II Software Requirement Specification:** Problem Analysis, Requirement elicitation and Validation, Requirements modeling: Scenarios, Information and analysis classes, flow and behavioral modeling, documenting Software Requirement Specification (SRS).

**System Design:** Design Concepts, design models for architecture, component, data and user interfaces; Problem Partitioning, Abstraction, Cohesiveness, Coupling, Top Down and Bottom Up design approaches; Functional Versus Object Oriented Approach, Design Specification, 4GL.

**Unit III Coding:** TOP-DOWN and BOTTOM-UP structure programming, Information Hiding, Programming Style, and Internal Documentation, Verification. **Software Testing:** Levels of Testing, Functional Testing, Structural Testing, Test Plan, Test Case Specification, Software Testing Strategies, Verification & Validation, Unit, Integration Testing, Top Down and Bottom Up Integration Testing, Alpha & Beta Testing, White box and black box testing

techniques, System Testing and Debugging. **Software Quality Assurance:** Software Configuration Management, Overview of Software Quality Control and Quality Assurance, ISO 9000 Certification for Software Industry, SEI Capability Maturity Model (CMM) and Comparison between ISO & SEI CMM.

**Unit IV Technical Metrics for Software:** A Framework for Technical Software Metrics, Metrics for the Analysis Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

**CASE (Computer Aided Software Engineering):** CASE and its Scope, CASE support in Software Life Cycle, Documentation Support, Architecture of CASE Environment. Exposure to CASE tools like Rational Software suit, Turbo Analyst, Silk Suite.

**Suggested Readings:**


1. Roger S. Pressman, Software Engineering, A Practitioner's Approach, McGraw Hill International Edition (2009) 7th edition.
2. Ian Sommerville, Software Engineering, Addison-Wesley Publishing Company, (2006) 8th ed.
3. Watts Humphery, A discipline for Software Engineering, Addison Wesley, Massachusetts (1995).
4. James F. Peter, Software Engineering - An Engineering Approach, John Wiley (2004).
5. Pankaj Jalote, An integrated Approach to Software Engineering, Narosa (2005).


## Course Name: Ability & Skill Enhancement Module- IV

## Course Code: 13003000

**Course Outline - Final Assessment – Mock Interviews & PI Kit Submission**

**Unit I - Tele – Etiquettes** Receiving Calls, Placing a call, Ending Calls, Transferring calls, Taking Message/ Voice Mails, Placing call on hold, Handling Complaints.

**Unit II – Confidence Building & Brain Storming** How to build confidence by positive thinking, identifying negative thoughts, how to control negative thoughts entering our mind, identifying personal talents, and its ways to improve, how to develop good habits and having principles and follow them at all times.

Need to learn new things, ideas and skills, what is brain storming, why do we need it, what are the different ways of brain storming through logics and reasoning, Brain Storming Session.

**Unit III – PI Kit** What is resume, Format of Resume, Formatting, Resume Preparation, Covering Letter, PI Kit.

**Unit IV - Interview Skills** Mastering the art of giving interviews in - selection or placement interviews, web /video conferencing, Mock Interview, HR Expert Mock Interview, Telephonic Interviews.

**Unit V – Internship Preparation: Company Specific Research and Presentation** Identifying domain specific industries, researching the industry, Industry analysis, Presentation on specific industry/company.

**Note:** The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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