Detailed Course Scheme

Bachelor of Computer Applications

(BCA)

Semester-V

(2020-2021)

DOC202002260022

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 along with examination pattern is as follows:

Course Scheme

Semester –V

S. No	Course Code	Course Name	L	T	P	Credits
1.	13012400	Analysis and Design of Algorithm	3	1	0	4
2.	13012500	Analysis and Design of Algorithm Lab	0	0	2	1
3.	13012600	Data Warehousing and Data Mining	3	0	0	3
4.	13012700	Mobile Computing	3	1	0	4
5.	13012800	Web Security Services	3	1	0	4
6.	13012900	Elective-I PHP & My SQL	3	0	0	3
7.	13013000	Elective-I PHP & My SQL Lab	0	0	2	1
8.	13012300	Summer Internship or Summer Project	0	0	8	4
9.	13003100	Ability & Skill Enhancement V	2	0	0	2
10.	99002800	Workshops & Seminars	-	-	-	1
11.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
		Total	**17**	**3**	**12**	**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

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
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	45
Attendance	75%+ : 5 marks	5
TOTAL	**50**	

External Assessment

Type	Marks
Practical	50

EVALUATION SCHEME- WORKSHOPS & SEMINARS AND HUMAN VALUES & SOCIAL SERVICE/NCC/NSS

1. The evaluation of Workshops & Seminar and Human Values & Social Service/NCC/NSS will be completed from Semester I – Semester VI. It will be evaluated internally by the various Forums & Schools Concerned. The credit for this will be given at the end of each Semester.

2. The students have to join club/clubs/Forums with the active participation in different activities of club. The students would be continuously assessed from Semester-I to Semester-IV and credits and marks would be given after the end of each Semester

CURRICULUM

Course Name: Analysis and Design of Algorithm

Course Code: 13012400

Objectives

To explain the concept of algorithm designing and how these algorithms are analysed. Discuss so many algorithms with their time complexities and perform a comparison between these algorithms.

Course Outline

Unit I: Introduction
Algorithm, analysis, Time complexity and space complexity, O-notation, Omega notation and Theta notation, Heaps and Heap sort, Sets and disjoint set, union and find algorithms. Sorting in linear time. Heaps and Heap sort Sets and disjoint set, Union and find algorithms. Sorting in linear time, Tower of Hanoi.

Unit II: Divide and Conquer
Divide and Conquer: general method, merge sort, binary search, Recurrences, Solving Recurrences by Substitution method, Recursive Tree Method. **Greedy Method -** General Strategy, Knapsack problem, Job sequencing with Deadlines , Minimum Spanning Trees , Dijkstra's algorithm.

Unit III: Dynamic Programming
Use of table instead of recursion, all pair shortest Path, 0/1 knapsack, Matrix Chain Multiplication, optimal binary search tree, Longest Common Subsequence, Travelling Salesperson Problem.

Unit IV: Backtracking & Problem Classes
8 queens problem, sum of subsets, graph coloring, NP-Hard And NP-Complete Problems, **Basic** concepts, of NP-Hard And NP-Complete Problems (Only concepts should be covered).

Suggested Readings:

1. Bressard, "Fundamental of Algorithm." PHI
2. Horowitz/Sahani, "Fundamentals of computer Algorithms", Galgotia.
3. Magnifying Data Structures, Arpita Gopal : PHI Publications
4. Thomas H Cormen and Charles E.L Leiserson, "Introduction to Algorithm" PHI
5. V. Aho and J.D. Ullman, "Design and Analysis of Algorithms", Addison Wesley

Course Name: Analysis and Design of Algorithm Lab

Course Code: 13012500

Objectives

To provide the knowledge of designing of algorithms and how these algorithms are analyzed in a proper way and finding out the time complexity of these algorithms by the help of c++ programs.

Course Outline

1. Implement Recursive Binary search and Linear search and determine the time required to search an element. Repeat the experiment for different values of n, the number of elements in the list to be searched and plot a graph of the time taken versus n.
2. Sort a given set of elements using the Heapsort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the

number of elements in the list to be sorted and plot a graph of the time taken versus n.

3. Sort a given set of elements using Merge sort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n.
4. Obtain the Topological ordering of vertices in a given digraph.
5. Sort a given set of elements using Quick sort method and determine the time required sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n.
6. Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm.

Course Name: Data Warehousing and Data Mining

Course Code: 13012600

Objectives

- The course addresses growing importance of Programming languages, their uses, and importance of using different programming tools. Course addresses various influences of language design and language implementation techniques like, compilers, interpreters. This course also explains about different expressions and statements used in different programming languages. Comparison of functional programming with logic programming, structure of imperative programming. Exceptions and exception handling procedures of different programming languages like, C++, Java.
- This course is an attempt to provide you with the basic information about data ware house and their development. This course also provides the basic conceptual background necessary to design and develop data ware house applications.

Course Outline

Unit I: Data mining
Introduction, Data mining – on what kind of data, data mining functionalities –what kind of patterns to be mined, Classification of data mining systems, data mining task primitives, integration of a data mining systems with a database or data warehouse systems, major issues in data mining. **Data pre-processing:** Descriptive data summarization, data cleaning, data integration and transformation, data reduction, data descretization and concept hierarchy generation.

Unit II: Data warehouse and OLAP technology

What is data warehouse, A multidimensional data model, data warehouse architecture, data warehouse implementation, data warehouse usage, OLAP, OLAM Mining frequent patterns, association and correlation, efficient and scalable frequent item set mining methods, From association mining to correlation analysis.

Unit III: Classification and prediction
Introduction, issues, classification by decision tree induction, rule based classification, classification by back propagation, lazy learners, other classification methods, Prediction: accuracy and error measures, evaluating the accuracy of a classifier or predictor. **Cluster Analysis:** Types of data in cluster analysis, a categorization of major clustering methods, partitioning methods.

Unit IV: Mining complex types of data
Multidimensional analysis and descriptive mining of complex data objects, mining spatial database, multimedia database, mining world wide web. Applications and trends in data mining: Data mining applications, data mining system products and research prototypes, social impact of data mining, trends in data mining.

Suggested Readings:
1. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P.Ltd.,2001.
2. Paul Raj Poonia, "Fundamentals of Data Warehousing", John Wiley & Sons, 2003.
3. Margaret Dunham, " Data Mining: Introductory and Advanced Topics, 1/e", Pearson.
4. G. K. Gupta, "Introduction to Data Mining with Case Studies", PHI, 2006.
5. W. H. Inmon, "Building the Operational Data Store",2nd Ed., John Wiley, 1999.
6. B. M. Shawkat Ali, Saleh A. Wasimi, "Data Mining Methods and Techniques", Cengage Learning, 2009.

Course Name: Mobile Computing

Course Code: 13012700

<u>**Objectives**</u>

- The Course based on Waves and Signals and it covers following topics: Basic Knowledge of wireless communications, Elementary Knowledge on Wireless Transmission, Elementary Knowledge on Medium Access Control, Elementary Knowledge on Telecommunications Systems, Mobile Internet, Implementing WAP Services: WML, Implementing WAP (Wireless Application Protocol) Services.

<u>**Course Outline**</u>

Unit I: Introduction to wireless communications
Applications, Short History of Wireless Communications, Market of Mobile Communications. **Elementary Knowledge on Wireless Transmission:** Frequency of Radio Transmission, Signals, Antennas, Signal Propagation: Path Loss of Radio Signals, Additional Signal Propagation Effects, Multipath Propagation, Multiplexing: Space Division Multiplexing, Frequency Division Multiplexing, Time Division Multiplexing, Code Division

Multiplexing, Modulation: Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Advanced Frequency Shift Keying, Advanced Phase Shift Keying, Multicarrier Modulation, Spread Spectrum: Direct Sequence Spread Spectrum, Frequency Hopping Spread Spectrum, Cellular Systems.

Unit II: Elementary Knowledge on Medium Access Control
Motivation for a specialized MAC, Hidden and exposed terminals, Near and far terminals, Introduction to SDMA, FDMA, TDMA: Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access, PRMA packet reservation multiple access, Reservation TDMA, Multiple access with collision avoidance, Polling, Inhibit sense multiple access, CDMA, Spread Aloha multiple access, Mobile communications, Comparison of S/T/F/CDMA.

Unit III: Elementary Knowledge on Telecommunications Systems
GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, New data services, DECT: System architecture, Protocol architecture. Elementary Knowledge on Satellite systems: History, Applications, Basics: GEO, LEO, MEO, Routing, Localization, Handover.

Unit IV: Mobile Internet
Introducing the Mobile Internet, Services for the mobile Internet, Business opportunities. **Implementing WAP Services: WML:** WML Variables and Contexts: Variable Substitution, Setting Variables, Browser Contexts.

Unit V: WAP
The Mobile Internet Standard, Making the Internet Mobile: Challenges and Pitfalls, Overview of the Wireless Application Protocol, **Implementing WAP Services:** WML Script: Data types, Variables, and Conversions, Operators and Expressions: Operand Conversions, Assignment Operators, Arithmetic Operators, Bitwise Operators, Shift Operators, Logical Operators, Increment and Decrement Operators ,Comparison Operators, Type Operators, The Conditional Operator, The Comma Operator, Precedence and Associativity, WML Script Statements: Expressions as Statements, Blocks of Statements, Conditions, Loops, Returning from a Function, Other Statements, WML Script, Dialogs

Suggested Readings:

1. Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition,2 003.
2. Sandeep Singhal, "Internet", Pearson Education, 2000
3. Learning WML, and WML Script, Programming the Wireless Web, Martin Frost, Publisher: O'Reilly 2000
4. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education,2002
5. Theodore S Rappaport, "Wireless Communication Principles and Practice", 2nd Ed ,Pearson Education. 2002
6. C. Y. Lee and William, "Mobile Cellular Telecommunications", 2nd Ed, McGraw Hill.2001

Course Name: Web Security Services

Course Code: 13012800

Objectives

- Enabling Knowledge: understand the design rationale for SOAP based web services in terms of objectives, trade-offs and alternatives. understand the architecture and design of the Apache Axis2 web Service framework. Critical analysis: Analyse and model requirements and constraints for the purpose of designing and implementing systems based on collaborating web services, with an emphasis on extensible and reusable architecture. Problem solving design and implement web services that accommodates specified functional and non-functional requirements and constraints. design web-based applications that consume such web Services.

Course Outline

Unit I: Introduction to web Service Technologies
Introduction to web services, Security for Web Services and Security Goals, Need of security and Privacy in web services, applications of web service security, SOA and Web Services Principles, Web Services Architecture, Web Services Technologies and Standards, SOAP, Web Services Description Language (WSDL).

Unit II : Web Service Threats Vulnerabilities, and Countermeasures
Threats and Vulnerabilities, Threats Modelling, Vulnerability Categorizations and Catalogs, Threats and Vulnerabilities Metrics.

Unit III: Standards for Web Service Security
The Concept of Standard Web Services Security, Standards Framework, An Overview of Current Standards, XML Data Security ,Security Assertions Markup Language (SAML), SOAP Message Security, Key and Trust Management standards, Standards for Policy Specification, Access Control Policy Standards, Implementations of Web Services Security Standards**.**

Unit IV: Digital Identity Management and Trust Negotiation
Overview of Digital Identity Management, Overview of Existing Proposals Liberty Alliance, WS-Federation, Comparison of Liberty Alliance and WS-Framework, Other Digital Identity Management Initiatives, Discussion on Security of Identity Management Systems, Business Processes.

Unit V: Access Control for Web Services
Approaches to Enforce Access Control for Web Services, WSAC: An Adaptive Access Control Model for Stateless, Web Services, The WS-AC Model, WS-AC Identity Attribute Negotiation, WS-AC Parameter Negotiation.

Suggested Readings

1. Elisa Bertino, Lorenzo D. Martino, Federica Paci, Anna C. Squicciarini, Security for Web Services and Service Oriented Architectures, Springer Science (2009).

Course Name: PHP & My SQL

Course Code: 13012900

Objectives

- The Course Divide in two parts: first one is PHP and Second is Mysql. PHP Covers following topics: Basic concepts of programming, Development Concept, Control Structure, Looping Structure, Function, File Inclusion, Working with Forms, Array, String Functions, Working with File Handling, OOPs concepts in php, Session, Cookies, Error Handling. and in second part Mysql: About Database forms, Working with MYSQL Admin, MySQL Function in PHP Database Connections, Query on tables, SQL Queries Create Database & Table Drop Database & Table Insert Record Select Record Deleting Record Modifying Record WHERE Clause Using Operators Sorting Records Eliminating Duplicates Grouping Records, Having Clause Joining Tables Sub queries Using Table And Column Aliases.

Course Outline

Unit-I
Introduction to PHP: What is PHP How PHP better than other Benefits Of Using PHP MYSQL Server Client Environment Web Browse Web Server Installation & Configuration Files.
Development Concept: How PHP Script Work PHP Syntax Write your First PHP Program Embed PHP In HTML/HTML In PHP PHP Data Type Variable In PHP Contents In PHP Operator In PHP.
Control Structure: If Statement If......Else Statement If...If Else Statement Nested If Statement Switch Statement

Looping Structure: For Loop While Loop Do...While Loop For each Loop

Function: What is function Syntax User Defined Function System Defined Function Parameterized Function Parameterized Function Date & Time Function Hash Function Mail Function

File Inclusion: Include () Require()

Working with Forms What is a Form? Important HTML Tags Super-Global Variable , Different ways to carry form data (GET, POST), isset(), is empty()

Unit II

Array: What is Array Syntax Associative Array Numeric Array Multi-Dimensional Array

String Function Chr() strlen() strpos() strcmp()

Working with File Opening File Reading File Writing File Closing File Appending File Uploading File

OOPs Concept Class & Object Access Modifier Properties of Object Encapsulation and abstraction Inheritance Polymorphism Function overriding Abstract class.

State Management Creating Cookies Set Cookies Destroying Cookies Creating Session Set Session Destroying Session

Error Handling & Exception Introduction to Error Try, catch, throw Block Handling.

Unit III

Introduction to MYSQL What is Database? Understanding an RDBMS Understanding Tables, Record & Fields SQL Language.

Working with MYSQL Admin Working with PHP My Admin Types Data Type Creating Database & Tables Dropping Database & Tables Adding Fields Selecting Table Alerting Fields Properties.

MySQL Function in PHP Database Connections Managing Database Connections Performing Queries Closing Connection.

Unit IV

SQL Queries Create Database & Table Drop Database & Table Insert Record Select Record Deleting Record Modifying Record WHERE Clause Using Operators Sorting Records Eliminating Duplicates Grouping Records, Having Clause Joining Tables Sub queries Using Table And Column Aliases

Suggested Readings:

1. PHP and MySQL Web Development All-in-One Desk Reference for Dummies, Janet Valade with Tricia Ballad, Bill Ballad, Willey 2008.
2. PHP and MySQL Web Development (Developer's Library) Kindle Edition, by Luke Welling, Laura Thomson, Sams Publishing.

Course Name: Elective II - PHP & My SQL Lab

Course Code: 13013000

Objectives

PHP & MYSQL Lab course cover all the practical part of basic or advance programming in php and number of query like create database/table, drop database/table, insert/delete, update data from table, create and remove session/cookie, use basic component of form and string functions etc.

Course Outline

1. Create a php webpage and print "hello world".
2. Create a php program to find odd or even number from given number.
3. Write a php program to find maximum among three numbers.
4. Write a PHP program to swap two numbers.
5. Write a PHP Program to demonstrate the variable function:
   a. Gettype()
   b. Settype()
6. Write a PHP Program to demonstrate the variable unction
   a. isset()
   b. unset()
7. Give the example of variable function:
   a. strval()
   b. floatval()
   c. intval()
   d. print_r()
   e. var_dump()
8. Give the example of string function
   a. substr()
   b. substr()
   c. strcmp()
   d. strcasecmp()
   e. strpos()
   f. strpos()
9. Write a PHP program that demonstrate form element(input elements).
10. Write a PHP program that demonstrate passing variable using URL.
    i. Write a PHP program that demonstrate use of session:1
    ii. Write a PHP program that demonstrate use of session:2
11. Write a program that demonstrate use of cookies: 1
12. Write a program that demonstrate use of cookies: 2
13. Write a PHP program to create a database using MySQL
14. Write a PHP program to drop a database using MySQL.
15. Write a PHP program to create a table in MySQL.

16. Write a PHP program to insert record into a table using MySQL.
17. Write a PHP program to drop table using MySQL.
18. Write a program to update table:6
19. Write a PHP program to select data and show into table format
20. Create a student Registration in PHP and Save and Display the student Records.
21. Write a program to Develop student registration form and display all the submitted data on another page.

Course Name: Ability & Skill Enhancement - V

Course Code: 13003100

Objectives

- The objectives of the module are to make students self-confident individuals by developing leadership and organising skills; to guide students in making appropriate and responsible decisions; to give each student a realistic perspective of work related skills and to help students prepare effective interview questions to conduct effective interviews.

Course Outline – Final Assessment - Interview with an Entrepreneur /Leader

Unit I: Leadership
What is leadership? Traits of Leadership, identifying leaders and traits of Leadership, Movie/ Story/ Interviews of leaders: Identify leadership qualities, Debate/ Discussion/ Presentations on leaders.

Unit II: Entrepreneurship
What is Entrepreneurship, Traits of Successful Entrepreneurs, Movie/ Story/Interviews of Entrepreneurs: Identify Entrepreneurial qualities, Debate/ Discussion/Presentation on Entrepreneurs.

Unit III: Organizational Skills & Employability Skills
What are organizational skills, how to develop them, the skills needed to become a successful entrepreneur/administrator, good communication, ambition, courage, hard work, planning, accountability. Organizational skills can be developed by discipline making a system, rules, delegation of power at workplace, etc.
How to enhance employability; skills, why do we need them, different workplaces, having different needs, different skills, how to recognize different work skills.

Unit IV: Decision making

The process of decision making, its steps, what are its basics, what are the basics of organizational decision-making process, entrepreneurial decision making, how to make a right decision at right time, dilemma.

Unit V: Interview Skills
Conducting Interviews with Leaders/ Entrepreneurs, Preparing Questions, Interviewing the fellow person, do's & don'ts while taking interview.

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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