Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
Bachelor of Computer Application (BCA) 3rd Year 5th Semester
Credit Based Scheme w.e.f. 2022-23

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA301C	Advance Java	3	0	-	25	75	-	100	3	3
2.	BCA303C	Software Project Management	3	0	-	25	75	-	100	3	3
3.		Elective –III	3	0	-	25	75	-	100	3	3
4.		Elective –IV	3	0	-	25	75	-	100	3	3
5.		Open Elective	3	0	-	25	75	-	100	3	3
6.	BCA321C	Software Lab-IX (Basedon BCA301C)	-	-	4	25	-	75	100	2	3
7.	BCA305C	Minor Project - I	-	-	4	25	-	75	100	3	3
		TOTAL	**15**	**0**	**8**	**175**	**375**	**150**	**700**	**20**	

Elective-III

BCA351C	Internet of Things
BCA353C	Design and Analysis of Algorithm
BCA355C	Cloud Computing
BCA357C	Multimedia Technologies
BCA359C	.Net framework with c# Programming

Elective-IV

BCA371C	Soft Computing
BCA373C	Foundation of Block Chain Technology
BCA375C	Cyber Security
BCA377C	Artificial Intelligence
BCA379C	System Administration

Open Elective

BBA102B	Principle of Management
BBA101B	Business Organization

DeenbandhuChhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
Bachelor of Computer Application (BCA) 3^{rdYear}6th Semester
Credit Based Scheme w.e.f. 2022-23

Group-A

Sr. No.	Course No.	Course Title	Teaching Schedule			Marksof Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA302C	Python Programming	3	0	-	25	75	-	100	3	3
2.	BCA304C	Introduction to Data Science	3	0	-	25	75	-	100	3	3
3.	BCA326C	Minor Project -II	-	0	4	50	-	100	150	9	3
TOTAL			6	-	-	100	150	100	350	15	

Group-B

Sr. No.	Course No.	Course Title	Teaching Schedule			Marksof Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA328C	Professional Training	-	-	-	100	-	250	350	15	3
TOTAL						100	-	250	350	15	

NOTE:

1. Gr. A students will have to do project in the department under the supervision of faculty member along with two subjects at sr. no. 1 and 2.
2. Gr. B students will have to undergo Professional Training of at least one semester from the industry, institute, research lab, training center etc. Students who have CGPA of minimum 6.0 till IV sem. with no backlog will only be permitted to proceed for Professional Training.
3. Each student will be allotted a supervisor from the department for both project as well as professional training.
4. Internal evaluation of Project –II and Professional Training will be carried out four times in a semester.
5. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculators will not be permitted in the examinations.

TOTAL CREDITS
B.C.A. = 159 (including first year)

Semester	1	2	3	4	5	6	Total
Credit	17	20	19	22	20	15	113

BCA301C – ADVANCE JAVA

Bachelor of Computer Application (B.C.A.)
BCA Semester - V

L	T	P	Credits			
3	0	-	3			

Class Work   : 25 Marks
Examination   : 75 Marks
Total   : 100 Marks
Duration of Examination   : 03 Hours

COURSE OBJECTIVE
Upon completion of this course the student should be able :

1. To familiar with concept of advanced java application and the design and development of GUI application using Swings.
2. To connect data structure and database with the Java Project.
3. To develop web application by creating client and server pages using servlet.
4. To practice the alternate of servlet i.e. Java Server Pages.

COURSE CONTENT

UNIT I

Basics of Advanced Java: Comparison between console application, GUI application and Web Application in Java. Advanced java features. Importance of Core Java while using advanced java features. Introduction to various kind of project of Advanced Java. Installation and use of Java, Java editor Netbeans, Eclipse etc. Role of Jar files in Java.

Java GUI Programming: Difference between AWT Controls & Swing Controls, various Swing Component and Container classes, Event Driven Programming using swing. GUI Project in Netbeans and Eclipse editors.

UNIT-II

Data Structure in Java: Role of data structure in software project, Java Collection, ArrayList, LinkedList, Stack, ArrayDeque, HashSet. Java Stream Classes,
Database Connectivity: Role of Database in Java Application**,** JDBC basics**,**JDBC classes and interfaces, database connectivity and query execution,

UNIT-III

Web Application Development: Client Server Technology, Request and Response on client and Server, Installation of Server like Tomcat etc.
Client & Server Programming: Creation of html pages/client pages, HTML form, Server Programming : Servlet, Lifecycle of a Servlet. Type of servlet : Servlet, GenericServlet&HTTPServlet classes, Connectivity of HTML and HTTPServlet : Post and Get method, web.xml file. Servlet Request & Response classesin HTTPServlet,

UNIT-IV
Java Server Pages : JSP Architecture, JSP Life Cycle, comparison of JSP and Sevlet, basic structure of JSP code file, JSP & HTML, JSP Scriptlet, JSP Implicit Object, JSP page directive, include directive.

Creation of complete application using JSP, servlet and database.

TEXT/REFERENCE BOOKS:

- Dietel and Nieto: Internet and World Wide Web – How to program?, PHI/Pearson
- Education Asia.
- Patrick Naughton and Herbert Schildt: The Complete Reference Java, Tata McGraw-Hill.
- Hans Bergstan: Java Server Pages.
- Bill Siggelkow, S P D O'Reilly: Jakarta Struts, Cookbook.
- Murach: Murach's beginning JAVA JDK 5, SPD.
- Wang-Thomson: An Introduction to Web Design and Programming.
- Knuckles: Web Applicat ions Technologies Concepts- John Wiley.
- Sebesta: Programming world wide web, Pearson.
- Building Web Applications-NIIT,PHI.4. JAVA 2(1.3) API Documentations

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES
By the end of the course the students will be able to:

1. Design and Develop GUI application and event driven programming using Swings.
2. Analyze the use of data structure in software and Design and develop database application.
3. Develop and design web application in Java using Servlet.
4. Develop and Design commercial web application using JSP.

BCA303C – SOFTWARE PROJECT MANAGEMENT

Bachelor of Computer Application (B.C.A.)
BCA Semester - V

L	T	P	Credits
3	0	-	3

Class Work	: 25 Marks
Examination	: 75 Marks
Total	: 100 Marks
Duration of Examination	: 03 Hours

COURSE OBJECTIVE
Upon completion of this course the student should be able :

1. To explain needs for software specifications and to study different types of software requirements gathering techniques.
2. To convert the requirements model into the design model and demonstrate use of software and user interface design principles.
3. To justify the role of SDLC in Software Project Development and to study risks associated with a project.
4. To generate project schedule and can construct, design and develop network diagram for different type of Projects.

COURSE CONTENT

UNIT I

Introduction to Software Project Management (SPM): Definition of a Software Project (SP), categorizing SPs, SP Vs. other types of projects, Fundamentals of Software Project Management (SPM), activities covered by SPM, Project Management Cycle, SPM Objectives, project as a system, management control, requirement specification, information and control in organization,
Stepwise Project planning: selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

UNIT II

Project Evaluation & Estimation:- Cost benefit analysis, cost benefit evaluation techniques, Selection of an appropriate project report, choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral-models. Prototyping, delivery.
Project Scheduling:- Objectives of activity planning, project schedule, projects and activities, Identifying activities, sequencing and scheduling activities, network planning model, Network Diagrams, CPM**,** representation of lagged activities, identifying critical path,
Risk Management:- Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule.

UNIT III

Resource allocation &monitoring the control: nature of resources, identifying resource requirements, scheduling resources, PERT, Gantt Charts, Error Tracking, Software Reviews, and Types of Review: Inspections, Desk checks, Walkthroughs, Code Reviews, and Pair Programming.

Managing contracts and people: types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures,

UNIT IV

Software quality Assurance and Testing:- Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Verification & validation, Concept of Software Quality, Software Quality Attributes, , SQA Activities, CASE Tools
Software quality: the importance of software quality, defining software quality, measures, product versus process quality management, external standards, techniques to help enhance software quality.

TEXT/REFERENCE BOOKS:

- Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH
- Software Engineering – A Practitioner's approach, Roger S. Pressman (5th edi), 2001, MGH
- Software Project Management, Walker Royce, 1998, Addison Wesley.
- Project Management 2/c. Maylor
- Managing Global software Projects, Ramesh, 2001, TMH.
- S. A. Kelkar, Software Project Management, PHI Publication.

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES
By the end of the course the students will be able to:

1. Explain needs for software specifications and different types of software requirements gathering techniques.
2. Convert the requirements model into the design model and demonstrate use of software and user interface design principles.
3. Justify the role of SDLC in Software Project Development and identify the risks associated with a project.
4. Generate project schedule and can construct, design and develop network diagram for different type of Projects.

BCA359C –.NET FRAMEWORK WITH C# PRORAMMING
Bachelor of Computer Application (B.C.A.)
BCA Semester - V

L	T	P	Credits
3	0	-	3

Class Work : 25 Marks
Examination : 75 Marks
Total : 100 Marks
Duration of Examination : 03 Hours

COURSE OBJECTIVE

Upon completion of this course the student should be able :

1. Understand the .NET FRAMEWORK fundamentals
2. Understand and implement object oriented features in C # programming language to solve the problem.
3. Explain & depict the Windows application development in .NET with C#programming.
4. Comprehend the .NET Framework components related with database objects.

COURSE CONTENT

UNIT I

.Net framework and c#: Evolution of the .NET Framework , Overview of the .Net Framework , .NET Features,.net framework Architecture, Role of CLR,CLS,CTS,variables, constants and expressions: Value Types and Reference Types – VariableDeclarations and Initializations, Value Data Types ,Reference Data Types , Boxingand Unboxing – Arithmetic Operators

UNIT II

Control statements, methods and arrays: types of methods – one dimensional array, multi-dimensional arrays – jagged arrays. String and string builder classes, classesdefinition and usage of a class – constructor overloading, copy constructor, instance and shared class members, operator overloading and method overloading.

UNIT III

Inheritance and polymorphism: virtual methods – abstract class and abstract methods – sealed classes. **Interfaces**: definition of interfaces – multiple implementations of interfaces –interface inheritance, access modifiers. Delegates.

Exception handling: default exception handling mechanism – user defined exception handling mechanism – throw statement – custom exception.

UNIT IV

Multithreading: usage of threads – thread class, start (), abort (), join (), and sleep () methods, suspend () and resume () methods, thread priority

Database connectivity: advantages of ado.net, managed data providers, developinga simple ado.net based application, creation of data table, retrieving data from tables, table updating, and disconnected data access through dataset

TEXT/REFERENCE BOOKS:
- By the end of the course the students will be able to: Balaguruswamy, " Programming with C#(TMH)
- Wiley,"Beginning Visual C# 2008",Wrox
- ShibiParikkar," C# with .net Framework"Firewall Media
- "C# Programming Black Book "Kogent Learning Solutions Inc.
- Joseph Albahari , Ben Albahari ," C# 9.0 in a Nutshell: The Definitive Reference"Oreilly

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES

By the end of the course the students will be able to:

1. Understand .Net framework and architecture.
2. Create console application using c# language.
3. Build window application with event handling
4. Design and implement a database application using ADO.net

BCA379C – SYSTEM ADMINISTRATION

Bachelor of Computer Application (B.C.A.)
BCA Semester - V

L	**T**	**P**	**Credits**		
3	0	-	3		

Class Work : 25 Marks
Examination : 75 Marks
Total : 100 Marks
Duration of Examination : 03 Hours

COURSE OBJECTIVE
Upon completion of this course the student should be able :

1. To understand UNIX operating system, its architecture and shell features
2. To become familiar with various Unix commands and utilities.
3. To understand various administration commands
4. To give overview of shell Programming.

COURSE CONTENT

UNIT I

Operating System Introduction: Introduction to operating system, Functions of operating system, Types of operating system

Introduction to unix and file system : A brief history of UNIX, The UNIX Architecture and Command structure usage, Basic Characteristics of UNIX, comparison between Unix and Windows ,System startup and shutdown , The Unix File Hierarchy ,UNIX File System – Boot block, super block, Inode table, data block.

UNIT II

Commands and Utilities: GENERAL PURPOSE UTILITIES - cal, date, man, echo, bc, clear, script, tty, passwd, who,.FILE and Directory HANDLING UTILITIES - pwd, cd, mkdir, rmdir, cat, cp, ls, wc, rm, mv, nl, pg, more, chmod, chown, chgrp DISK UTILITIES – du, df, mount, umount wait NETWORKING UTILITIES – ping, telnet, rlogin, ftp, arp, finger, Absolute and relative pathnames, communication commands ,editor , PROCESS UTILITIES –ps, fg, bg, kill, stop

Introduction To Shells: UNIX Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Background processing .

UNIT – III
System administration: Role of system administrator, Functional activities of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance ,Maintaining Security, Getting System Information,

becoming super user using su. Backup and restore files Configure X-windows desktop, starting & using X desktop.

UNIT – IV

Shell programming: Basic of shell programming, comparisons between various shells, Special shell parameters , wild card characters , Types of statement, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords.

FILTERS: Filters, concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, uniq, comm, pr , diff and cmpFilters using regular expressions - grep, egrep and sed

TEXT/REFERENCE BOOKS:

- Sumitabha Das, "Unix Concepts And Applications", 4thEdition. TMH, 2006
- Behrouz A. Forouzan, Richard F. Gilbery, "Unix and Shell Programming", Cengage Learning India, 2003.
- Graham Glass, King Ables, "Unix for Programmers and Users", 3rdEdition, Pearson Education, 2009.
- N.B Venkateswarlu, "Advanced Unix programming", 2ndEdition, BS Publications, 2010.
- YashwanthKanitkar, "Unix Shell programming", 1stEdition, BPB Publisher, 2010.
- Maurice J. Bach, Design of the UNIX Operating System, Prentice Hall, 1986

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES
By the end of the course the students will be able to:

1. Describe Basic architecture of Unix operating system
2. Use a variety of common Unix commands and utilities
3. Demonstrate the role and responsibilities of a UNIX system administrator
4. Develop shell scripts to perform tasks.

L	T	P	Credits			
3	0	-	3			

Class Work   : 25 Marks
Examination   : 75 Marks
Total   : 100 Marks
Duration of Examination   : 03 Hours

COURSE OBJECTIVE
Upon completion of this course the student should be able :

1. To expose basic concepts of management and to enable them to gain appreciation for emerging ideas, techniques, procedures and practices in the field of management.
2. To explain how managers align the planning process with company mission, vision, and values and explain the process and techniques of individual and group decision-making.
3. To identify common organizational structures and gain knowledge towards organizational processes.
4. To study the system and process of effective controlling in the organization.

COURSE CONTENT

UNIT I

Introduction – nature and process of management, principles and functions of management, basic managerial roles and skills, approaches to management – classical, human relations and behavioral, systems and contingency approaches; contemporary issues and challenges

UNIT II

Planning and decision making – concept, purpose and process of planning, types of plans, strategic planning, tactical planning and operational planning, goal setting, MBO; decision making – nature and process, behavioral aspects of decision making, forms of group decision making in organizations.

UNIT III

Organizing and leading: elements of organizing – division of work, departmentalization, distribution of authority, coordination; organization structure and design; leadership – nature and significance, leadership styles, behavioral and situational approaches to leadership.

UNIT IV

Motivation; concept and nature; need hierarchy and 'motivation-hygiene' theories of motivation Management control – nature, purpose and process of controlling, kinds of control system, prerequisites of effective control system, controlling techniques.

TEXT/REFERENCE BOOKS:

- Heinz Weihrich& Harold Koontz, Management A global prospective, McGraw Hill Education.
- Robbins, S.P. and Decenzo, D.A. Fundamentals of Management, Pearson Education. PravinDurai, Principles of Management, Pearson Education.
- Deepak Kr. Bhattacharya, Principles of Management: Text and Cases: Pearson Education.
- Hellregel, Management, Cengage Learning.
- Stoner, Freeman, Gilbert, Management, Pearson Education.
- Robbins & Coulter, Management, Pearson Education.
- SatyaRaju, Management- Text & cases, PHI Learning Pvt. Ltd
- Richard L. Daft, Management, Thomson south-Western.
- Anil Bhatt & Arya Kumar, Management: Principles, Processes and Practices. Oxford University Press.

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES
By the end of the course the students will be able to:

1. Describe the influence of historical forces on the current practice of management and Identify and evaluate social responsibility and ethical issues involved in business situations
2. Have clear understanding of managerial functions like planning, and have knowledge on Organizational decision making
3. Understand the concept of organization.
4. Demonstrate the ability to directing, leadership and communicate effectively and to analysis isolate issues and formulate best control methods

(Based on BCA301C)
Bachelor of Computer Application (B.C.A.)
BCA Semester - V

L	T	P	Credits			
3	0	-	3			

Class Work : 25 Marks
Examination : 75 Marks
Total : 100 Marks
Duration of Examination : 03 Hours

COURSE CONTENT

Practical will be based on the Paper Advance Java Programming on whole Syllabus.

BCA302C – PYTHON PROGRAMMING

Bachelor of Computer Application (B.C.A.)
BCA Semester - VI

L	T	P	Credits		
3	0	-	3	Class Work	: 25 Marks
				Examination	: 75 Marks
				Total	: 100 Marks
				Duration of Examination	: 03 Hours

COURSE OBJECTIVE

Upon completion of this course the student should be able :

1. To familiar with basic concept of python and its programming fundamental
2. To learn how to use and make functions
3. To learn the object oriented programing and exception handling in python
4. To learn the use open source library for GUI and web development

COURSE CONTENT

UNIT I

Introduction: Introduction to Python, Features of Python, comparison of Python with C, C++ and Java, Python run time environment, Python Byte code, Application of Python, Installing Python, IDLE, Python editors. **Programming Fundamental:** input/output statements, indentation, Control statements, List, Tuples, Dictionaries, Sequence & Files,

UNIT II

Functions: Python built in functions and their use, library in python, Function Definition, Function Call, Return, Function Argument: default, keyword, arbitrary, function pass by object & reference, Lambda function, special variable __name_, comparison between filter(), map(), reduce() functions. **Modules:** inbuilt and user defined module, importing a module, packages.

UNIT III

Object Oriented Programming: Python objects and other object oriented languages, Classes & objects, class methods, Inheritance **Exception handling:** exception handling in python, try, except, finally statements, built-in exception classes, handling multiple exceptions, **File handling:** File creation, open, reading and writing.

UNIT IV

Advanced Concept: Text Manipulation: Basic String Manipulation and Regular Expressions,Multithreading in Python, NumPyLibrary : Installing, array, processing an array, SciPy library, Developing user interface with TKinter, Web Development : writing HTML pages,

TEXT/REFERENCE BOOKS:

1. Core Python Programming by R Nageswar Rao, Dream Tech Publication.
2. Beginning Programming with Python For Dummies, 2ed by John Paul Mueller, Wiley Publication
3. Let us Python by YashvantKenetkar, Aditya Kanetkar, BPB Publication
4. Python: The Complete Reference by Martin C Brown, McGraw Hill Publication
5. KamthaneKamthane, Programming and Problem Solving with PYTHON, Tata McGraw-Hill Education.

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES
By the end of the course the students will be able to:

1. Design and Develop basic python program using list, tuple and dictionary
2. Design and develop functional and modular application in python
3. Develop and design object oriented application with exception handling
4. Analyze the use of open source library of python.

L	T	P	Credits		Class Work	: 25 Marks
3	0	-	3		Examination	: 75 Marks
					Total	: 100 Marks
					Duration of Examination	: 03 Hours

COURSE OBJECTIVE

This course is an introductory course in computer & information technology. Upon completion of this course the student should be able :

1. To understand the basic concepts of Data science.
2. To enhance skills and knowledge in preparing data for analysis, including cleaning data, manipulating data, and dealing with missing data
3. To understand the role of machine learning techniques and basic concepts of clustering and classification techniques
4. To understand the Big Data Platform and its Use cases

COURSE CONTENT

UNIT I

Introduction to Data Science: Definition, benefits and uses of data science and big data.Facets of Data: Structured data, unstructured data, natural language, machine generated data,Network data, audio, images and video streaming data, Introduction to data science tools.

UNIT II

Data Science Processes: Six steps of data science processes, define research goals, data retrieval, data preparation: cleansing data, correct errors as early as possible, integrating – combine data from different sources, transforming data, data exploration, Data modelling, presentation and Automation.

UNIT III

Machine Learning: Definition, Applications of machine learning in data science, Types of Machine Learning (Degree) - supervised learning, semi supervised learning, un-supervised learning, Classification Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification ,Cluster Analysis : Basic Concept and Methods Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods

UNIT IV

Big data:-Introduction to Big data, big data technologies, management of big data, four V's in big data, Drivers for Big data, Big data analytics, Big data applications, designing dataarchitecture, Big data Vs. data warehouse.

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TEXT/REFERENCE BOOKS:

1. Davy Cielen Arno D. B. Meysman Mohamed Ali "Introducing data Science, "
2. Rachel Schutt and Cathy O'Neil, "Doing Data Science"
3. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to DataMining", Person Education, 2007.
4. K.P. Soman, ShyamDiwakar and V. Ajay ", Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2016.
5. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
6. Dr. Anil Maheshwari, "Data Analytics", McGraw Hill Education (India) Private Limited.

* Latest and additional good books may be suggested and added from time to time

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

COURSE OUTCOMES
By the end of the course the students will be able:

1. To understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists.
2. To explain how data is Pre-processed in data science.
3. To apply mining techniques on data using clustering and classification techniques.
4. To Identify Big Data and its Business Implications.

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE AND TECHNOLOGY
GUIDELINES FOR PROJECT
(BACHELOR OF COMPUTER APPLICATIONS - Sixth Semester)

GUIDELINES FOR PROJECT WORK TO BE CARRIED OUT IN AN INDUSTRY/RESEARCH LAB

- The Department/Training and Placement (T&P) officer of the Institution will arrange training slots for the students, however, the student in consultation with the Department /T&P cell can arrange for industrial training slot in reputed Industry/Research labs.
- At least one faculty member from the Department is to be associated with each student and designated as teacher-in-charge.
- The student is required to send his/her joining report, duly signed by the industry coordinator, to the Department, to his/her teacher-in-charge within two weeks of joining.
- The teacher-in-charges will visit the industries at least twice in the semester. First visit is to be made within first two months of the commencement of Project work. The second visit is to be made in the last month of the Project duration.

GUIDELINES FOR PROJECT REPORT

1. **Project Report (BCA -328)**
   - **The project proposal should be prepared in consultation with your guide.** The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. **The project work should compulsorily include the software development.** The project proposal should contain complete details in the following form:
   - Synopsis of the project proposal (15-20 pages) covering the following aspects may be prepared:
       (i) Title of the Project
       (ii) Introduction and Objectives of the Project
       (iii) Project Category

          ➢ Technology Used: (RDBMS/OOPS/Networking/Multimedia/Artificial Intelligence/Expert Systemsetc)

         ➢ Tools/Platform, Hardware and Software Requirement specifications

(iv)   Introduction &Description about the organization

(v)   Training Letter from the organization

2.   A project proposal, once approved, **is valid for one year.** In case, a student is unable to submit her/his project report within one year, she may be given another chance for submission of the project report subject to validity of his/her registration.

3.   A **photocopy of the complete Project Proposal** submitted to, should be retained by the student for future reference.

4.   The evaluated project proposal proforma along with the details of Approved/Disapproved will be sent to the student within 4-6 weeks after the university/Institute receives the proposal. In case if it is disapproved, the suggestions for reformulating the project will be communicated to the student. Revised project proposal proforma, should be sent along with the original copy / photocopy of the non-approved proforma of the earlier project proposal, to theUniversity.

5.   The project is a part of your final Year curriculum.

6.   Violation of the project guidelines will lead to the rejection of the project at anystage.

PREPARATION FOR THE PROJECT REPORT

1. **Project ReportFormulation:**

    The project report **should** contain the following:

    i)   Projectdocumentation

    ii)   A CD consisting of the executable file(s) of the complete project should be attached on the last page of the project report. In no case, it should be sentseparately.

2. The **project documentation** may be about 100 to 125 pages (excluding coding). The project documentation details should not be too generic in nature. Appropriate project report documentation should be done, like, **how you have done the analysis, design, coding, use of testing techniques / strategies, etc.,** *in respect of your project***.** To be more specific, whatever the theory in respect of these topics is available in the reference books should be avoided as far as possible. **The project documentation should be in respect of your project only.** The project documentation should include the topics given below. Each and every component shown below carries certain weightage in the project reportevaluation.

    ➢ Cover Page / Title Page

    ➢ Training Certificate issued from college

    ➢ Training completion certificate from company

    ➢ Acknowledgement

    ➢ Table of Contents / Index with pagenumbering

    ➢ List of Tables

    ➢ List of Figures

    ➢ List of Symbols, Abbreviations and Nomenclature

    ➢ Introduction

       ▪ About the Organisation

       ▪ Aims / Objectives of Organisation

    ➢ Project Selection: About Project

    ➢ System Study/ Analysis
       ▪ Identification ofNeed

       ▪ Preliminary Investigation

       ▪ FeasibilityStudy

- ProjectPlanning
- ProjectScheduling
- Software requirement specifications(SRS)
- Software Engineering Paradigmapplied
- Data model, Control Flow diagrams, state Diagrams/Sequence diagrams ERD's/Class Diagrams/CRC Models/Collaboration Diagrams/Use-case Diagrams/Activity Diagrams depending upon your projectrequirements.

- Project Monitoring system
  - Pert Chart / Gantt chart
- Requirement Specification
  - System Requirement (System analysis)
  - Software Req.
  - Hardware Requirement
- System design
  - Database design
  - System flowchart design
  - DFD / UML Modelling /Design
  - Program Design
  - Screen Design
  - Report Design
- System Testing
  - Test Data Preparation
  - Type of testing applied
  - Implementation of Testing
- System Implementation
  - In what manner system will be implemented.
- Documentation
  - Operational Document
  - User Manual
- Further Scope of project-Where the project can be further extended
- Bibliography & references
  - List of references at the end of a text, whether cited or not. It will include texts you made use of, not only texts you referred to, but your own additional background reading, and any other articles that proved helpful in exploring the project.

Note: Students need to make 3 copies of Project Report– all should be hard bound (Spiral binding will not be accepted)

Attach a copy of the CD containing the executable file(s) of the complete project

3. The project report should normally be printed with 1.5 line spacing on A4 paper (one side only). All the pages, tables and figures must be numbered. Tables and figures should contain titles.

4. If any project report is not according to the guidelines, it will be summarily rejected and returned to the student forcompliance.

5. **Two copies of the original project report** in the bound form along with the CD (containing the executable file(s) of the project should be enclosed in the last page) is to be submitted to the College. **One photocopy** of the same Project Report and the CD containing the executable file(s) must be retained by the student, which should be produced before the examiner at the time ofviva-voce.

6. A photocopy of the project report is **not acceptable** for submission.

7. Title of the project should be kept the same throughout theproject.

GUIDELINES FOR PROJECT EVALUATION

Each component of the project work carries its own weightage, so the student needs to concentrate on all the sections given in the project report formulation.

In this section, we have given a few general parameters as checkpoints for the assessment of any software development project. You can note these points and emphasize them during the project report preparation and examination. Assessment will be based on the quality of your report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual effort, you have put into the project. Project execution is concerned with assessing how much work you have put in.

Project Evaluation

The Project Report is evaluated for 250 marks. A student in order to be declared successful in the project (BCA-328C) must secure **40% marks**

Course No.	Title	Marks of Class Work	Examination Practical	Total	Credit	Exam Duration
BCA 328C	Professional Training	100	250	350	15	**3**

The University will appoint external examiner to conduct the viva-voce examination and the Practical marks will be awarded on the basis of project report, presentation and project execution during the conduct of Practical examination in the institute as per given weightage scheme is

Project Report	**30%**
Presentation	**30%**
Execution	**40%**

Unfair means

Projects copied from other students will be considered to have used unfair means. If two projects are found identical, zero marks will be awarded to both of them. In such a case the projects will have to be resubmitted on new topic.

(To be Printed on Letter Head of the Institute /College)

To

_____

_____

_____

Dear Sir/Madam

We take this opportunity to introduce ourselves as a pioneer institute imparting full time course Bachelor of Computer Application affiliated to DCRUST, Murthal

As a part of this course the students of BCA can undertake the training in the industries. We shall be highly obliged if you facilitate our students under your valuable guidance.

We hope that this would be a healthy and fruitful experience for the students and the organization as well. We are enclosing herewith the resume of …………………………and Roll No…………………… for your kind consideration.

We shall be highly indebted by your support in this regard. Any further queries in this regard shall be highly appreciated.

Thanking you

Sincerely
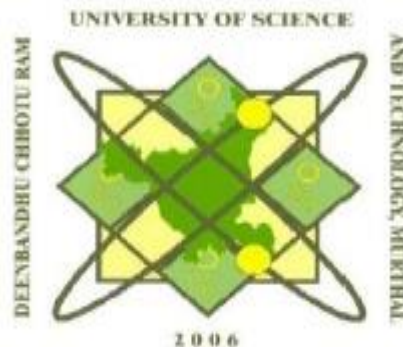
Director/ Principal/ Training & Placement Head

PROJECT REPORT
ON

(Project Name)

Submitted in the partial fulfillment of requirement for the award of degree of Bachelor of Computers Applications
Session (_____)

Under supervision of	**Submitted by:-**
(Name of Faculty)	*(Student Name)*
(Designation)	*(University Roll no)*

DEPARTMENT OF COMPUTER SCIENCE
DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE AND TECHNOLOGY
MURTHAL, SONIPAT