SHAHEED NANDKUMAR PATEL VISHWAVIDYALAYA, RAIGARH (C.G.)

(A State University Established under Chhattisgarh Vishwavidyalaya Adhiniyam. 1973)

Scheme and Syllabus

of

Bachelor of Computer Application (BCA)

(Year – Third)

W.E.F. Session :- 2025-26

Syllabus Approved by the Central Board of Studies

शहीद नंदकुमार पटेल विश्वविद्यालय, रायगढ़ (छ.ग.)

(छत्तीसगढ़ विश्वविद्यालय अधिनियम 1973 द्वारा स्थापित राजकीय विश्वविद्यालय)

नवीन पाठ्यक्रम सत्र 2023–24 से लागू

BCA

Learning Outcome Based Scheme and Syllabus of Examination

for

Bachelor of Computer Application (BCA)

Courses Effective from Academic Session 2022-23

1. **Title of the program:** The title of the programme shall be Bachelor of Computer Application (B.C.A.).
2. **Eligibility for admission:** Eligibility of admission in BCA will be as follow:
   i. Student must passed H.Sc. (Class 12th) in any stream/Three year diploma course in any branch of technical education or equivalent from recognized board.
   ii. Student must have minimum aggregate of 40% marks in H.Sc. examination (Relaxation in percentage will be as per rule of C.G. Govt.).
3. **Scheme of examination:** Each theory paper is divided into two components as follow, however there shall not be any Internal Assessment (IA) for practical subject.
   i. University Examination (UE): 75 Marks
   ii. Internal Assessment (IA): 25 Marks
4. **Internal Assessment (IA):** The structure of IA shall be as follow:
   i. **Internal test (15 Marks):** There shall be three internal tests of 15 marks each, the average of best two shall be considered as the marks of internal test.
   ii. **Other activity (10 Marks):** Presentation/Group discussion /Assignment/ MOOC course certification (List of MOOC course shall be provided to the students through notice board/college website by the HOD concern after mapping it from SWAYAM, Coursera or any other similar popular platforms at the beginning of each academic session) or any other similar activity.
5. **University Examination (UE):** The pattern of examination shall be as follow:
   i. There shall be two sections of question paper: A and B
   ii. Section A (15 Marks) shall be compulsory and shall consists 15 short/objective questions each of one mark covering the entire syllabus.
   iii. Section B (60 Marks) shall consist questions from 5 unites as per the syllabus with internal choice (Student has to attempt only one question from each unit). Each unit shall be of 12 marks.

6. **Programme Learning Outcomes for Bachelor of Computer Application (BCA)**

On completion of this programme, the students are expected to:

PLO1: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

PLO2: Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PLO3: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

PLO4: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PLO5: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PLO6: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PLO7: Develop software projects in various languages as per the demand of the market.

PLO8: Work on research based projects.

PLO9: Develop live software projects and will be capable of working in IT companies.

Dr. Vikrant Gupta
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PLO10: Explore and gain new knowledge through MOOC courses.
PLO11: Ability to pursue higher studies of specialization and to take up technical employment.
PLO12: Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
PLO13: Apply standard Software Engineering practices and strategies in real-time software project development.
PLO14: The ability to work independently on a substantial software project and as an effective team member.
PLO15: Ability to operate, manage, deploy and configure software operation of an organization.

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Scheme of BCA

Year	Course Code	Subject Name	Theory/ Practical	Total Credit	Marks			
					UE	IA	Total	
					Max	Max	Max	Min
First	BCA-1T	Discrete Mathematics	Theory	6	75	25	100	33
	BCA-2T	Computer Fundamental and MS office	Theory	4	75	25	100	33
	BCA-3T	Programming with C and C++	Theory	4	75	25	100	33
	BCA-4T	Data Structure	Theory	6	75	25	100	33
	BCA-5T	Digital Electronics	Theory	6	75	25	100	33
	BCA-6T	Hindi	Theory	5	50	-	50	17
	BCA-7T	English	Theory	5	50	-	50	17
	BCA-1P	LAB 1: PC software	Practical	2	100	-	100	33
	BCA-2P	LAB 2: Programming with C and C++	Practical	2	100	-	100	33
Second	BCA-8T	Numerical Mathematics	Theory	6	75	25	100	33
	BCA-9T	Operating System	Theory	6	75	25	100	33
	BCA-10T	Relational Database Management System	Theory	4	75	25	100	33
	BCA-11T	Computer Networking and Cyber Technology	Theory	6	75	25	100	33
	BCA-12T	Web Technology	Theory	4	75	25	100	33
	BCA-13T	Hindi	Theory	5	50	-	50	17
	BCA-14T	English	Theory	5	50	-	50	17
	BCA-3P	LAB 3: Relational Database Management System	Practical	2	100	-	100	17
	BCA-4P	LAB 4: Web Technology	Practical	2	100	-	100	17
Third	BCA-15T	Python Programming	Theory	4	75	25	100	33
	BCA-16T	Java Programming	Theory	4	75	25	100	33
	BCA-17T	Software Engineering	Theory	6	75	25	100	33
	BCA-18T	Artificial Intelligence and Expert System	Theory	6	75	25	100	33
	BCA-19T	E-Commerce	Theory	6	75	25	100	33
	BCA-20T	Communication Skill	Theory	5	100	-	100	33

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	BCA-5P	LAB 5: Java	Practical	2	100	-	100	33
	BCA-6P	LAB 6: Python	Practical	2	100	-	100	33
	BCA-7P	Project	Practical	5	100	-	100	33

Note:

1. Syllabus of Foundation Courses: Hindi and English shall be similar to B.Sc. Computer Science/IT program.
2. Students has to pass environment studies subject as per the rule of any other B.Sc. program.
3. There shall be four extra credits in all the years of under graduation for internship/apprenticeship/skill development program. The certificate of extra credits would be provided by the concern university and is not mandatory.

Abbreviations used:

UE: University Exam
IA: Internal Assessment

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Part A: Introduction

Program: **Degree Course**	Class: **B.C.A. III Year**	Year: **2022**	Session:**2022-2023**

1.	Course Code	**BCA-15T**
2.	Course Title	**Python Programming**
3.	Course Type	**Theory**
4.	Pre-requisite (if any)	Basic knowledge of programming and concept of object oriented programming
5.	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Define the structure and components of a Python program. • Demonstrate proficiency in handling of loops and creation of functions. Identify the methods to create and manipulate lists, tuples and dictionaries. • Discover the commonly used operations involving regular expressions and file system. • Determine the need for scraping websites and working with CSV. JSON and other file formats. • Interpret the concepts of Object-Oriented Programming as used in Python.
6.	**Credit Value**	**Theory : 4**
7.	**Total Marks**	**Max. Marks: 25+75** | **Min Passing Marks : 33**

Part B: Content of the Course

Total Periods: 60

Unit	Topics	No. of Periods
I.	**Introduction to Python:** Installing Python, basic syntax, interactive shell, editing, saving, and running a script, the concept of data types; variables, assignments; immutable variables: numerical types, Operators (Arithmetic Operator, Relational Operator, Logical or Boolean operator, Assignment. Operator, Ternary operator, Bit wise Operator, Increment or Decrement operator) and Expressions, comments in the program, understanding error messages.	12
II.	**Creating Python Programs:** Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, exit function, Difference between break, continue and pass.) **Function:** Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.	12
III.	**Strings and text files**: manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab-separated). **String manipulations:** subscript operator, indexing, slicing a string; **strings and number system**: converting strings to numbers and vice- versa. Binary, Octal, Hexadecimal numbers.	12
IV.	**Lists, Tuples, and Dictionaries;** Basic list Operators, replacing, inserting, removing an element, searching and sorting lists, Accessing tuples, Operations, Working, Functions and Methods, dictionary literals, adding and removing keys, accessing and replacing values, Traversing Dictionaries.	12

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V.	**Exception Handling:** Exception, Exception Handling, except clause, try, finally, clause, User defined exceptions. **Python Libraries:** Exploring python libraries like Panda, Numpy, TensorFlow, Scikit-Learn, Keras, PyTorch, SciPy etc.	12
Keywords: List, Tuple, Dictionary, Panda, Numpy, TensorFlow, Scikit-Learn, Keras, PyTorch, SciPy.		

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist: Learning with Pyth, Freelyavailableonline, 2012
3. Luca Massaron John Paul Mueller, Python for Data Science For Dummies, Wiley, 2ed, 2019
4. Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd edition, O'Reilly, 2015
5. Zed A. Shaw, Learn Python 3 the Hard Way, Addison-Wesley, 2016

E-Resources:

1. Introduction
   https://www.w3schools.com/python/default.asp
2. File Handling
   https://www.w3schools.com/python/python_file_handling.asp
3. NumPy
   https://www.w3schools.com/python/numpy/default.asp
4. Pandas
   https://www.w3schools.com/python/pandas/default.asp
5. SciPy
   https://www.w3schools.com/python/scipy/index.php
6. Django
   https://www.w3schools.com/django/index.php
7. Matplotlib
   https://www.w3schools.com/python/matplotlib_intro.asp
8. Machine Learning
   https://www.w3schools.com/python/python_ml_getting_started.asp
9. Python MySQL
   https://www.w3schools.com/python/python_mysql_getstarted.asp
10. Topics related Python from SWAYAM/NPTEL
    https://www.youtube.com/channel/UCxu1cR5XRauYn37yg-Fh6rA
    https://www.youtube.com/channel/UCJAgw1niUkaShdmA5aAZdQw
11. Introduction to Python Programming from Coursera:
    https://www.coursera.org/learn/python-programming-intro

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12. Crash Course on Python:
https://www.coursera.org/learn/python-crash-course

13. Python for everybody:
https://www.coursera.org/specializations/python

14. Introduction to Scripting in Python Specialization
https://www.coursera.org/specializations/introduction-scripting-in-python

15. Topics related to Python from Tutorials
https://www.javatpoint.com/python-tutorial
http://docs.python.org/3/tutorial/index.html
http://interactivepython.org/courselib/static/pythonds
http://www.ibiblio.org/g2swap/byteofpython/read/

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 25 Marks University Exam(UE): 75 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

Declaration

The syllabus of this subject is frame as per the TOR of department of higher education, Chhattisgarh.

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   Prof. and Head, Dept. of Computer Science and Application
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   Prof. and Head, SoS in Computer Science, Pt. Ravishankar Shukla University, Raipur
3. Mr. Jitendra Kumar - Member
   Asst. Prof., Dept. of Computer Science and Application
   Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur
4. Mr. H.S.P. Tonde - Member
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   Sant Gahira Guru University Sarguja, Ambikapur
5. Dr. Mamta Singh - Member
   Asst. Prof. and Head, Sai College, Bhilai
   Hemchand Yadav Vishwavidyalaya, Durg
6. Mr. Sushil Kumar Sahu - Member

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3/6/2022

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Pt. Ravishankar Shukla University, Raipur

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Sant Gahira Guru University Sarguja, Ambikapur

12. Mr. Suresh Kumar Thakur - Member
Asst. Prof. and Head, Indira Gandhi Govt. PG College, Vaishali Nagar
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13. Dr. Ugrasen Suman - Member (Present Online)
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Date: 03.06.2022

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Part A: Introduction

Program: **Degree Course**	Class: **B.C.A. III Year**	Year: **2022**	Session:**2022-2023**
1. Course Code	**BCA-16T**		
2. Course Title	**Java Programming**		
3. Course Type	**Theory**		
4. Pre-requisite (if any)	No		
5. Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Develop programming skill and learn how to implement new Platform Independent software. • Develop new Packages which help them to develop new application software and Utility Software. • Develop new Online Software and Internet Games with the help of Applet and AWT Packages. • Learn about TCP/IP Client and Server Sockets which helps them to develop Networking Software • Familiar about Applet, Thread and Servlet Life Cycle which helps them to develop value added services for Internet Users. • Learn about new Integrated Development Environment and new Web servers.		
6. **Credit Value**	**Theory: 4**		
7. **Total Marks**	**Max Marks: 25+75**	**Min Passing Marks : 33**	

Part B: Content of the Course

Total Periods: 60

Unit	Topics	No. of Periods
I.	**Overview of JAVA:** The genesis of java, History of java, Java Virtual Machine (JVM), Java development kit (JDK), Source Files, Jar Files, Compiling and Running of Files, Byte Code, Platform Independency, Data types, Literals, Variables, Constants, Array and it's types, Operators, Conditional and looping statements, various packages, Introduction of class, objects and methods, nested and inner class, string handling, constructor, writing simple JAVA program.	12
II.	**Inheritance, Packages and interface-** Concept of super and sub class, types of inheritance, access specifiers, Method Overriding, Abstract Class, Constructor in Multilevel Inheritance, using final with Inheritance. **Package:** Defining package, Rules for creating a new Package, CLASSPATH, Access protection, Importing Package .**Interface:** Defining and Implementing Interface, extending interface, nested interface, importance of interface in Java.	12
III.	**Exception Handling and Multithreading:** Using try and catch, multiple catch classes, Nested try statements, throw, throws and finally, Built in Exception, Uncaught Exception, Creating own Exception class. **Java Thread Model:** Main thread, Creating own Thread, Life cycle of thread, Thread priorities, Synchronization, Interthread Communication, Suspending, Resuming and Stopping thread.	12

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IV.	**Java Packages: I/O classes:** Byte Stream and Character Stream, Predefined Stream, reading console input, writing console output. **Applet:** Applet Life Cycle, Creating an applet, Using image and sound in applet. **Lang:** Various classes, Importance class Definition, **Util:** Framework, Event Model, Scanner Class **AWT:** Exploring AWT, Event handling – The delegation-event model, Event classes, Source of event, Event listener interfaces ,handling mouse and keyboard event ,Adapter class **Networking:** classes and interface ,Socket, TCP/IP Client Socket and Server Socket, Inet address, URL Connection.	12
V.	**Server site programming and database connectivity:** Servlet – Overview of Servlet, Life cycle of servlet, JAVA servlet architecture , Generic servlet and http servlet ,The servlet interface, Request and response **Integrated Development Environment:** Eclipse IDE, Netbeans IDE, MyEclipse IDE **Web Servers:** Apache Tomcat Web Server, JBoss Server **Database Connectivity:** JDBC API, Basic Connectivity with Oracle and SQL Server.	12
Keywords: Class, Packages, Web Servers, Servlet, Applet, Socket, Java Server Pages (JSP).		

Part C - **Learning Resource**
Text Books, Reference Books, Other Resources
Suggested Readings: 1. The complete reference, Naughton P and Schildt H., Osborne , McGraw-Hill, Berkeley Publication. 2. An Introduction to JAVA programming, James R. Levenick ,Firewall Media publication. 3. Java Programming,By E.Balgurusamy, McGraw-HillPublication. 4. Core JAVA for beginners, Rashmi KantaDas ,Vikas Publication. 5. SWAYAM url link for Java : https://onlinecourses.swayam2.ac.in/aic20_sp13/preview 6. SWAYAM url link for Java : https://onlinecourses.nptel.ac.in/noc19_cs84/preview 7. SWAYAM url link for Java : https://www.dqindia.com/iit-bombay-offers-free-online-course-java-swayam-platform/ 8. SWAYAM url link for Java : https://www.classcentral.com/course/swayam-programming-in-java-12930

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: MaximumMarks:100 Continuous Comprehensive Evaluation (CCE): 25 Marks University Exam(UE): 75 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

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The syllabus of this subject is frame as per the TOR of department of higher education, Chhattisgarh.

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03.06.2022

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Part A: Introduction

Program: Degree Course	Class: BCA III Year	Year: 2022	Session: 2022-2023

1.	Course Code	**BCA-17T**
2.	Course Title	**Software Engineering**
3.	Course Type	**Theory**
4.	Pre-requisite (if any)	Basic Knowledge of programming methodology and database management system
5.	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Basic knowledge and understanding of the analysis and design of complex systems. • Ability to apply software engineering principles and techniques. • To produce efficient, reliable, robust and cost-effective software solutions. • Ability to work as an effective member or leader of software engineering teams. • To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.
6.	**Credit Value**	**Theory : 6**
7.	**Total Marks**	**Max. Marks: 25 +75** | **Min Passing Marks : 33**

Part B: Content of the Course

Total Periods: 90

Unit	Topics	No. of Periods
I.	**Software Development Approaches**: Introduction; Evolving Role of Software; Software Characteristics; Software Applications. Software Design Processes: Introduction; What is Meant by Software Engineering? , Definitions of Software Engineering; The Serial or Linear Sequential Development Model; Iterative Development Model; The Incremental Development Model.	18
II.	**Software Design Principles**: Introduction, System Models: Data -flow Models, Semantic Data Models, Object Models, Inheritance Models, Object Aggregation, Service Usage Models, Data Dictionaries; Software Design: The Design Process, Design Methods, Design description, Design Strategies, Design Quality; Architectural Design: System Structuring, The Repository Model, The Client–Server Model, The Abstract Machine Model, Control Models, Modular Decomposition, Domain-Specific Architectures.	18
III.	**Object Oriented Design:** Introduction; Object Oriented Design: Objects, Object Classes & Inheritance, Inheritance, Object Identification, An Object -Oriented Design Example, Object Aggregation; Service Usage; Object Interface Design: Design Evolution, Function Oriented Design, Data–Flow Design; Structural Decomposition: Detailed Design.	18
IV.	**An Assessment of Process Life-Cycle Models**: Introduction; Overview of the Assessment of Process; The Dimension of Time; The Need for a Business Model in Software Engineering; Classic Invalid Assumptions: First Assumption: Internal or External Drivers, Second Assumption: Software or Business Processes, Third Assumption: Processes or Projects, Fourth Assumption: Process Centered or Architecture Centered; Implications of the New Business Model;	18

अध्ययन मंडल .....
शहीद नंदकुमार पटेल
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अध्यक्ष .....
अध्ययन मंडल
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	Redefining the Software Engineering Process: Round-Trip Problem-Solving Approach, Activities, Goals, Interdisciplinary Resources, Time.	
V.	**Software Reliability: Introduction;** Software Reliability Metrics; Programming for Reliability: Fault Avoidance, Fault Tolerance, Software Reuse. **Software Testing Techniques:** Introduction; Software Testing Fundamental; Testing Principles; White Box Testing; Control Structure Testing; Black Box Testing; Boundary Value Analysis; Testing GUIs; Testing Documentation and Help Facilities; Software Testing Strategies: Introduction; Organizing for Software Testing; Software Testing Strategy, Unit Testing: Unit Test Considerations, Top -Down Integration, Bottom-Up Integration.	12
Keywords: Software Engineering, Development Model, Data Flow Model, Data Dictionary, Testing.		

Part C - **Learning Resource**
Text Books, Reference Books, Other Resources

Suggested Readings:

1. R. G. Pressman – Software Engineering, TMH
2. Sommerville, Ian, Software Engineering, Pearson Education
3. Pankaj Jalote – An Integrated Approach to Software Engineering, Narosa Publications.
4. Pfleeger, Shari Lawrence, Software Engineering Theory and Practice, second edition. Prentice- Hall 2001.
5. Object Oriented & Classical Software Engineering (Fifth Edition), SCHACH,TMH

E Resources:

1. Introduction to Software Engineering from NPTEL: https://nptel.ac.in/courses/106101061
2. Software Engineering from Coursera https://www.coursera.org/specializations/software-engineering
3. Software Development Life Cycle from Coursera: https://www.coursera.org/specializations/software-development-lifecycle
4. Software Design Architecture fromCoursera: https://www.coursera.org/specializations/software-design-architecture
5. Software Engineering from SWAYAM/NPTEL https://onlinecourses.nptel.ac.in/noc19_cs69/preview

Part D: **Assessment and Evaluation**		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 25 Marks University Exam(UE): 75 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

अध्ययन मंडल .....
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शहीद नंदकुमार पटेल
विश्वविद्यालय, रायगढ़ (छ.ग.)

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Date: 03.06.2022

अध्ययन मंडल
शहीद नंदकुमार पटेल
विश्वविद्यालय (छ.ग.)

अध्यक्ष
विश्वविद्यालय, रायगढ़ (छ.ग.)

Part A: Introduction

Program: Degree Course	Class: B.C.A. III Year	Year: 2022	Session:2022-2023

1.	Course Code	**BCA-18T**
2.	Course Title	**Artificial Intelligence and Expert System**
3.	Course Type	**Theory**
4.	Pre-requisite (if any)	Basic knowledge of data structure
5.	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Understand a wide variety of learning algorithm. • Understand how to evaluate models generated form data. • Apply the algorithm to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models. • Apply ML algorithms in various domains. • Simulate real world problems using ML Techniques. • Apply Deep Learning technique for Computer Vision.
6.	**Credit Value**	**Theory: 6**
7.	**Total Marks**	**Max Marks: 25+75** | **Min Passing Marks: 33**

Part B: Content of the Course

Total Periods: 90

Unit	Topics	No. of Periods
I.	**Introduction:** Overview of Artificial Intelligence (AI), Domains of Artificial Intelligence, Foundations of AI, Domain-base and Knowledge-base Database. History of AI, Areas and state of the art in A.I., A.I. problems, Knowledge: Introduction, Knowledge Based system, Knowledge representation techniques.	18
II.	**Searching Technique:** Problem solving as state space search, production system, control strategies a problem characteristic, Search techniques: Breadth First search, Depth-first search, Hill-climbing Heuristic search, Best-First search, greedy method, A* algorithm , AO* algorithm.	18
III.	**A.I. Programming languages:** Introduction to LISP, Basic list manipulation functions, Input/output and local variables, Lists and Arrays, simple program in LISP, Introduction to PROLOG.	18
IV.	**Knowledge Representation:** Approaches and Issues ,Frame, Conceptual dependency . Semantic Net, Scripts etc. ,Propositional Logic, First order, Propositional Logic (FOPL), Conversion to clausal form, Inference rules, Resolution principal.	18
V.	**Expert System-** Introduction, Application, Existing Expert systems, Components of typical expert system, Rule based system architecture.	18

Keywords: Heuristic Search, A* Search, Artificial Intelligence (AI), List Processing (LISP), Programming in Logic (PROLOG), Expert System.

Part C - Learning Resources

Text Books, Reference Books, Other Resources

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शहीद नंदकुमार पटेल
विश्वविद्यालय, रायपुर (छ.ग.)

Suggested Readings:

1. Artificial Intelligence and Machine Learning, Vinod Chandra S.S., AnandHareendrn S, PHI learning private Ltd.
2. Introduction to Artificial Intelligence and Expert System, Dan W. Patterson, PHI Publication.
3. Artificial Intelligence, Elaine Rich and Kevin Knight TMH publication.
4. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems , PHI Publication.
5. Elaine Rich and Kevin Knight , Artificial Intelligence ,TMH publication.
6. V.S. Jankiraman, K. Sarukesi and P. Gopalakrishnan ,Foundations of Artificial Intelligence and Expert Systems , Macmillan Series in Computer Science.

E Resources:

1. Overview of Machine Learning
   https://www.youtube.com/watch?v=whSKA8aO6xQ&list=PLyqSpQzTE6M-SISTunGRBRiZk7opYBf_K&index=3
2. Introduction to Artificial Intelligence
   https://www.youtube.com/watch?v=pKeVMlkFpRc&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=2
3. Problem Solving as State Space Search
   https://www.youtube.com/watch?v=fLw8SfvaJWA&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=3
4. Uninformed Search
   https://www.youtube.com/watch?v=te1K8on1Pk0&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=4
5. Heuristic Search
   https://www.youtube.com/watch?v=0awSpFyh2MY&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=5
6. Informed Search
   https://www.youtube.com/watch?v=-Rf2hOyjZB8&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=6

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 25 Marks
University Exam(UE): 75 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

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03.06.2022
03-06-2022

अध्ययन मंडल
शहीद नंदकुमार पटेल
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Devi Ahila Vishwavidyalaya, Indore

Date: 03.06.2022

अध्यक्ष

Part A: Introduction

Program: Degree Course	Class: BCA III Year	Year: 2022	Session:2021-22
1 Course Code	BCA-19T		
2 Course Title	E-Commerce		
3 Course Type	Theory		
4 Pre-requisite (if any)	No		
5 Course Learning Outcomes (CLO)	• At the end of this course, the students will be able to become familiar with the mechanism for conducting business transactions through electronic means.		
6 Credit Value	Theory: 6		
7 Total Marks	Max. Marks: 25+75	Min Passing Marks: 33	

Part B: Content of the Course

Total No. of Periods: 90

Unit	Topics	No. of Periods
I	**Introduction of E-Commerce:** Meaning, nature, concepts, advantages, disadvantages and reasons for transacting online, types of E-Commerce, e-commerce business models (introduction , key elements of a business model and categorizing major E-commerce business models), forces behind ecommerce. **Technology used in E-commerce:** The dynamics of world wide web and internet (meaning, evolution and features); Designing, building and launching e-commerce website (A systematic approach involving decisions regarding selection of hardware, software, outsourcing vs. in-house development of a website).	18
II	**Security and Encryption:** Need and concepts, the e-commerce security environment: (dimension, definition and scope of e-security), security threats in the E-commerce environment (security intrusions and breaches, attacking methods like hacking, sniffing, cyber-vandalism etc.), technology solutions (Encryption, security channels of communication, protecting networks and protecting servers and clients).	18
III	**IT Act 2000 and Cyber Crimes:** IT Act 2000: Definitions, Digital signature, Electronic governance, Attribution, acknowledgement and dispatch of electronic records, Regulation of certifying authorities, Digital signatures certificates, Duties of subscribers, Penalties and adjudication, Appellate Tribunal, Offences and Cyber-crimes.	18
IV	**E-payment System**: Models and methods of e–payments (Debit Card, Credit Card, Smart Cards, e-money, UPI payment), digital signatures (procedure, working and legal position), payment gateways, online banking (meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting), risks involved in e-payments.	18
V	**On-line Business Transactions:** Meaning, purpose, advantages and disadvantages of transacting online, E-commerce applications in various industries like banking, insurance, payment of utility bills, online marketing, e-tailing (popularity, benefits, problems and features), online services (financial, travel and career), auctions, online portal, online learning, publishing and entertainment, Online shopping.	18

Keywords: E-Commerce, Encryption, IT Act, Cyber Crime, E-Payment Systems, Online Business Transactions.

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Part C - Learning Resources
Text Books, Reference Books, Other Resources

Suggested Readings

1. Kenneth C. Laudon and Carlo Guercio Traver, E-Commerce, Pearson Education.
2. David Whiteley, E-commerce: Strategy, Technology and Applications, McGraw Hill Education.
3. Bharat Bhaskar, Electronic Commerce: Framework, Technology and Application, 4th Ed., McGraw Hill Education.
4. PT Joseph, E-Commerce: An Indian Perspective, PHI Learning.
5. KK Bajaj and Debjani Nag, E-commerce, McGraw Hill Education.
6. TN Chhabra, E-Commerce, Dhanpat Rai & Co.
7. Sushila Madan, E-Commerce, Taxmann
8. TN Chhabra, Hem Chand Jain, and Aruna Jain, An Introduction to HTML, Dhanpat Rai & Co.

E Resources: –

1. Electronic Commerce : https://www.youtube.com/watch?v=xKJjyn8DaAw
2. Technology used in E-Commerce : https://www.youtube.com/watch?v=cPVwPQCsROc
3. E-Commerce : https://www.tutorialspoint.com/e_commerce/index.htm
4. E-Commerce : https://egyankosh.ac.in/handle/123456789/72073

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 25 Marks University Exam(UE): 75 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

अध्यक्ष
अध्ययनमंडल
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    - Member (Present Online)

Date: 03.06.2022

Part A: Introduction

Program: Degree Course	Class: BCA III Year	Year: 2022	Session:2022-23

1	Course Code	BCA-20T
2	Course Title	Communication Skill
3	Course Type	Ability Enhancement Course
4	Pre-requisite (if any)	To study this course, a student must have command over English Language which will be helpful to learn the subject
5	Course Learning Outcomes (CLO)	At the end of this course, the students of computer application will be able to speak and write english with a fare degree of grammatical correctness. The inputs in the course contents are designed to let the students develop their communication skills and effectively write and speak in business scenario.
6	**Credit Value**	**Theory : 5**
7	**Total Marks**	**Max. Marks: 50** / **Min Passing Marks : 17**

Part B: Content of the Course

Total Periods: 75

Unit	Topics	No. of Periods
I	**Structure of sentences:** Simple, Complex and Compound. **Clauses:** Co-ordinate and Subordinate Clause, The senses and aspects, Model, Gerund, Participle: Non Finite and Finite, Infinitive.	15
II	**Transformation of sentences:** Interchange of Active and Passive Voice, Interchange of Affirmative and Negative Sentences, Interchange of Explanative and Assertive Sentences, Interchange of Interrogative and Assertive Sentences, Direct and Indirect Speech.	15
III	**Writing Skills:** Report writing, Resume writing, Applications writing, Letter writings: Formal (Covering Letter, Enquiry Letter, Order Letter, Complaint Letter, Sales Letter) and Informal, Description of events-Designing of Poster, Flyer, Banner.	15
IV	**Presentation Skills:** Precise Writing, Reading Comprehension, Summarizing, Paraphrasing, Presentation Skills, Interview Skills, Group Discussion.	15
V	**Official Communication:** Notice, Circular, Minutes of meeting, Agenda of Meeting, Memorandum. Modern media of communication-Email (Language of Email, Format, E-mail writing strategies, Advantage, Characteristics, Formatting), Use of Social Media, Video Conferencing.	15

Keywords: Clauses, Transformation of Sentences, Writing Skills, Paraphrasing, Official Communication, Social Media.

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(छ.ग.)

Part C - Learning Resource

Text Books, Reference Books, Other Resources

Suggested Readings:

Text Books:

1. Living English Structure by W.S. Allen.
2. A Practical English Grammar by Thomson and Martinet
3. English Grammar and Composition by Wren & Martin
4. Advance Grammar in Use by Martin Hewings
5. Essentials of Business Communication by Rajendra Pal and J.L. Korlahalli
6. Effective Technical Communication by M. Ashraf Rizvi

E-Resources:

1. Grammar (Clauses, Gerund and Infinitives, Coordinating conjunctions) - https://www.digimat.in/nptel/courses/video/109106129/L13.html
2. Voice : https://www.grammarly.com/blog/active-vs-passive-voice/
3. Report Writing : https://www.grammarly.com/blog/how-to-write-a-report/

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50

Continuous Comprehensive Evaluation (CCE): As per rule

University Exam(UE): 50 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	As per rule

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अध्ययन मंडल ..... शहीद नंदकुमार पटेल विश्वविद्यालय (छ.ग.)

अध्यक्ष ..... अध्ययन मंडल शहीद नंदकुमार पटेल विश्वविद्यालय, रायगढ़ (छ.ग.)

Part A: Introduction

Program: Degree Course		Class: B.C.A. III Year	Year: 2022	Session: 2022-2023
1	Course Code	BCA-5P		
2	Course Title	LAB 5: Java		
3	Course Type	Practical		
4	Pre-requisite (if any)	Theoretical knowledge of Java and Python		
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Develop front end application using front end technologies. • Demonstrate the principles of object-oriented programming. • Create multi-threaded programs and event handling mechanisms • Express different Decision-Making statements and Functions.		
6	Credit Value	Practical: 2		
7	Total Marks	Max. Marks: 100	Min Passing Marks : 33	

Part B: Content of the Course

Total Periods: 30

Tentative Practical List

Note: This is tentative list; the teachers concern can add more program as per requirement.

1. Create a java program to implement stack and queue concept.
2. Write a java package to show dynamic polymorphism and interfaces.
3. Write a java program to show multithreaded producer and consumer application.
4. Create a customized exception and also make use of all the 5 exception keywords.
5. Convert the content of a given file into the uppercase content of the same file. 6. Develop an analog clock using applet.
6. Develop a scientific calculator using swings.
7. Create an editor like MS-word using swings.
8. Create a servlet that uses Cookies to store the number of times a user has visited your servlet.
9. Create a simple java bean having bound and constrained properties.
10. Write a java program to create an abstract class named shape that contains two integers and an empty method named print Area () Provide three classes named Rectangle. Triangle and Circle such that each one of the classes extends the class shape. Each one of the class contains only the method print Area () that print the area of the given shape.
11. Write a Java program that implements a multithreaded program that has three threads. First thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd the third thread will print the value of the cube of the number.
12. Write a java program which creates a list containing ice cream flavours. On selection of any flavour price should be displayed in a text field.
13. Write a JDBC program to create a table product (id number, name varchar. Price varchar). And insert a record in the table.

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	14. Write a program to execute a select query using JDBC. 15. Write a program to execute an Update query using JDBC. 16. Write a server program to return the square root of a number to the client using Socket. 17. Write a server program to return Date and time to clients using socket programming. 18. Write a JSP program for basic arithmetic functions. 19. Write a advance java program to implement registration of student by using JSP. 20. Write a program to design a web page for login form and connect to the database while using JSP and JDBC.

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

1. The Complete Reference JAVA, Herbert Scheldt, Tata McGraw Hill publication, 5º Edition.
2. Advance JAVA, Gajendra Gupta, Firewall Media, 1" Edition, 2006.
3. JAVA network programming, Elliotte Rusty Harold, O'Reilly Publication, 3" Edition.
4. Core Java for Beginners, Rashmi Kanta Das, Vikas Publishing House Pvt. Ltd.

E Resources:

1. Introduction to Java
   https://www.youtube.com/watch?v=QjdT2l-EZJA&list=PLfn3eNtmZdPOe3R_wO_h540QNfMkCQ0ho&index=1
2. Introduction to Database
   https://www.youtube.com/watch?v=mte0HHrUKpI&list=PLJ5C_6qdAvBEJ6-TBzKoa1Ov2HwDzJfM&index=12
3. Introduction to SQL
   https://www.youtube.com/watch?v=ar2naKy0aPw&list=PLJ5C_6qdAvBEJ6-TBzKoa1Ov2HwDzJfM&index=16

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): Not Applicable
University Exam(UE): 100 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	Not Applicable

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Declaration

The syllabus of this subject is framed as per the TOR of department of higher education, Chhattisgarh.

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   Prof. and Head, SoS in Computer Science, Pt. Ravishankar Shukla University, Raipur - Member
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    Pt. Ravishankar Shukla University, Raipur - Member
11. Ms. Anjeeta Kujur
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    Sant Gahira Guru University Sarguja, Ambikapur - Member
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    Hemchand Yadav Vishwavidyalaya, Durg - Member
13. Dr. Ugrasen Suman
    Prof. and Head, Dept. of Computer Science
    Devi Ahila Vishwavidyalaya, Indore - Member (Present Online)

DATE: 03.06.2022

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विभागाध्यक्ष
कंप्यूटर साइंस
शहीद नंदकुमार पटेल
विश्वविद्यालय, रायगढ़ (छ.ग.)

Part A: Introduction				
Program: Degree Course		Class: B.C.A. III Year	Year: 2022	Session: 2022-2023
1	Course Code	BCA-6P		
2	Course Title	LAB 6: Python		
3	Course Type	Practical		
4	Pre-requisite (if any)	Theoretical knowledge of Java and Python		
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Develop front end application using front end technologies. • Demonstrate the principles of object-oriented programming. • Learn the Numbers, Math functions, Strings, List in Python. • Learn the tuples and dictionaries in Python. • Demonstrate proficiency in handling of loops and creation of functions. • Identify the methods to create and manipulate lists, tuples and dictionaries. • Express different Decision-Making statements and Functions.		
6	Credit Value	Practical: 2		
7	Total Marks	Max. Marks: 100	Min Passing Marks : 33	

Part B: Content of the Course	
Total Periods: 30	
Tentative Practical List	**Note:** This is tentative list; the teachers concern can add more program as per requirement. 1. Python program to find the union of two lists. 2. Python program to find the intersection of two lists. 3. Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature. 4. Using while loop, produce a table of sins, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) and tan(x). 5. Write a program that reads an integer value and prints —leap yearl or —not a leap yearl. 6. Write a program that takes a positive integer n and then produces n lines of output shown as follows. For example, enter a size: 5 * ** *** **** ***** 7. Write a function that takes an integer _n'as input and calculates the value of 1 + 1/1! + 1/2! + 1/3! + … + 1/n 8. Write a function that takes an integer input and calculates the factorial of that number. 9. Write a function that takes a string input and checks if it's a palindrome or not.

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10. Write a list function to convert a string into a list, as in list (_abc') gives [a, b, c].
11. Write a program to generate Fibonacci series.
12. Write a program to check whether the input number is even or odd.
13. Write a program to compare three numbers and print the largest one.
14. Write a program to print factors of a given number.
15. Write a method to calculate GCD of two numbers.
16. Write a program to create Stack Class and implement all its methods. (Use Lists).
17. Write a program to create Queue Class and implement all its methods. (Use Lists)
18. Write a program to implement linear and binary search on lists.
19. Write a program to sort a list using insertion sort and bubble sort.
20. Python program to remove the "i" th occurrence of the given word in a list where words repeat.
21. Python program to count the occurrences of each word in a given string sentence.
22. Python program to check if a substring is present in a given string.
23. Python program to map two lists into a dictionary.
24. Python program to count the frequency of words appearing in a string using a dictionary.
25. Python program to create a dictionary with key as first character and value as words starting with that character.
26. Python program to find the length of a list using recursion.
27. Python program to read a file and capitalize the first letter of every word in the file.
28. Python program to read the contents of a file in reverse order.
29. Python program to create a class in which one method accepts a string from the user and another prints it.
30. Study and Implementation of Database, Structured Query Language and database connectivity.

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

T. Budd, Exploring Python, TMH, 1st Ed, 2011

1. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist: Learning with Pyth.Freelyavailableonline.2012
2. Luca Massaron John Paul Mueller, Python for Data Science For Dummies, Wiley, 2ed, 2019
3. Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd edition by O'Reilly, 2015
4. Zed A. Shaw, Learn Python 3 the Hard Way (Addison-Wesley, 2016)

E Resources:

1. Introduction
   https://www.w3schools.com/python/default.asp
2. File Handling
   https://www.w3schools.com/python/python_file_handling.asp
3. NumPy
   https://www.w3schools.com/python/numpy/default.asp
4. Pandas
   https://www.w3schools.com/python/pandas/default.asp
5. SciPy

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https://www.w3schools.com/python/scipy/index.php

6. Django
   https://www.w3schools.com/django/index.php
7. Matplotlib
   https://www.w3schools.com/python/matplotlib_intro.asp
8. Machine Learning
   https://www.w3schools.com/python/python_ml_getting_started.asp
9. Python MySQL
   https://www.w3schools.com/python/python_mysql_getstarted.asp
10. https://www.youtube.com/channel/UCxu1cR5XRauYn37yg-Fh6rA (from SWAYAM/NPTEL)
    https://www.youtube.com/channel/UCJAgw1niUkaShdmA5aAZdQw

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): Not Applicable
University Exam(UE): 100 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	Not Applicable

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Declaration

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    Devi Ahila Vishwavidyalaya, Indore

DATE: 03.06.2022

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Part A: Introduction

Program: Degree Course	Class: B.C.A. III Year	Year: 2022	Session: 2022-2023
1 Course Code	BCA-7P		
2 Course Title	LAB 7: Project		
3 Course Type	Practical		
4 Pre-requisite (If any)	Theoretical knowledge of Java and Python		
5 Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Evaluate the framework and characteristics of a project. • Identifying areas for improvement.		
6 Credit Value	Practical: 5		
7 Total Marks	Max. Marks: 100	Min Passing Marks : 33	

Part B: Important Guidelines for Project

Total Periods: 30

A project report has to be submitted as per the rules described below:

1. **Number of Copies:** The student should submit One hard bound copy of the Project Report with one RW/CD/DVD.
2. **No of students:** Every student has to submit separate project.
3. **Acceptance / Rejection of Project Report:** The student must submit a project report to the Head of Department/Project Guide for approval. The Head of Department/Project Guide holds the right to accept the project or suggest modifications for resubmission.
4. **Format of the Project Report :**The student must adhere strictly to the following format for the submission of the Project Report
   - I. **Paper:** The report shall be typed on white paper, A4 size or continuous computer stationary bond, for the final submission. The report to be submitted to the University must be original and subsequent copies may be photocopied on any paper.
   - II. **Typing:** The typing shall be of standard letter size, double-spaced and on one side of the paper only, using black ribbons and black carbons.
   - III. **Margins:** The typing must be done in the following margins
     Left ----- 35mm, Right ----- 20mm
     Top ----- 35mm, Bottom ----- 20mm
   - IV. **Binding:** The Report shall be Rexene bound in black. Plastic, spiral bound Project Reports not be accepted.
   - V. **Front Cover:** The front cover should contain the following details:
     TOP: The title in block capitals of 6mm to 15mm letters.
     CENTER: Full name in block capitals of 6mm to 10mm letters.
     BOTTOM: Name of the University, year of submission- all in block capitals of 6mm to 10mm letters on separate lines with proper spacing and centring.
   - VI. **Blank Sheets:** At the beginning and end of the report , two white black bound papers should be provided, one for the purpose of binding and other to be left blank.

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5. **Abstract:** Every report should have an abstract following the Institute's Certificate. The abstract shall guide the reader by highlighting the important material contained in the individual chapters, section, subsection etc.
6. **Certificates etc:** The report should contain the following:
    I. Certificate from Company
    II. Institute Certificate: Successful completion of project by competent authority.
    III. Acknowledgment
    IV. List of Figures
    V. Tables
    VI. Nomenclature and Abbreviations
7. **Contents of the Project Report:** The project report must contain following in form of chapter, however student may include any other relevant chapter(s):
    I. **Company Profile:** This chapter should highlight the company details. This would be chapter 1 and should include the main stream activity of the company, the product line of the company and the details of the department where the student has carried out his/her project work. This should not exceed two pages or 800 words.
    II. **Introduction to the project:** This chapter shall highlight the purpose of project work, it will also define the chapters to be followed in the Project Report.
    III. **Scope of work:** Brief scope of the project work done
    IV. **Existing System and Need for proposed System:** If there is some system already in use, then give brief detail of it in order to help to understand the enhancements carried out by the student in the existing system.
    V. **Operating Environment:** Hardware and Software required and used.
    VI. **Proposed System:** Which may contain following:
        a. **Objectives to be fulfilled:** clearly define the objective(s) of the system.
        b. **User Requirements:** State the requirements of the use in an unambiguous manner.
        c. **Requirements Determination Techniques and Systems Analysis Methods Employed:** Use the formal methods to describe the requirements of the use like Fact Finding Methods, Decision Analysis, Data Flow Analysis etc.
        d. **Prototyping:** If the prototypes has been developed prior to the detailed design, then give details of the prototype.
        e. **System Feature:** Which includes as follows:
            - Module specifications
            - D.F.D. and ER
            - System flow charts
            - Data Dictionary
            - Structure charts
            - Database /File layouts
            - Design of Input Design of Output screens and reports
            - User Interfaces
            - Design of Control Procedures
8. **Testing procedures and Implementation phase**
9. **Problems encountered, Drawbacks and Limitations**

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10. Proposed Enhancements/ Future enhancement **11. Conclusions** **12. Bibliography** **Annexure**

Part C - Learning Resources		
Text Books. Reference Books, Other Resources		
Suggested Readings: Not Applicable **E-Resources:**		
Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): Not Applicable University Exam(UE): 100 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	Not Applicable

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