श्री Davara University

Established under Chhattisgarh Private Universities (Establishment and Operation) Act, 2005

BCA

SEMESTER-III

Programme Curriculum

SEMESTER III

S.NO	COURSE CODE	COURSE TITLE	TEACHING HOURS PER WEEK				EXAMINATION SCHEME				
							THEORY		PRACTICAL		TOTAL MARKS
DISCIPLINE SPECIFIC COURSE			L	T	P	C	EX	IN	EX	IN	
1.	CASC-07	Software Engineering	3	1	0	4	70	30	-	-	100
2.	CASC-08T	Relational Database Management System	3	-	0	3	70	30	-	-	100
3.	CASC-09T	Programming in Java	3	-	0	3	70	30	-	-	100
DISCIPLINE SPECIFIC ELECTIVE											
4.	CASE-01	Cyber Security and Cyber Law	4	-	0	4	70	30	-	-	100
VALUE ADDITION COURSE											
5.	DUVAC-03	Disaster Management	2	0	0	2	35	15	-	-	50
ABILITY ENHANCEMENT COURSE											
6.	AEC-03	Environmental Science	2	0	0	2	35	15	-	-	50
PRACTICAL LAB											
7.	CASC-08P	Lab 5: RDBMS	-	-	2	1	-	-	35	15	50
8.	CASC-09P	Lab 6: Programming in Java	-	-	2	1	-	-	35	15	50
Total Credit: 20							Total Marks: 600				

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-III**	**Session: 2024-2028**
Course Code	**CASC-07**		
Course Title	**Software Engineering**		
Course Type	**DSC (Discipline Specific Course)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Understand the fundamentals of Software Engineering. • Identify and analyze the requirement of system. • Understand the design of existing system and design the proposed system. • Understand the fundamentals of software Project management. • Create the test-cases and perform system testing. • Apply the concepts of software engineering for new system development.		
Credit Value	**4 Credits**	**Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-60 Periods (60 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Software Engineering & Models:** The evolving role of software, changing nature of software, Evolution of Software Engineering, Characteristics of software. SDLC Introduction, Software Process Models: Waterfall Model, V-model, Prototype model, RAD model, Incremental development model, Spiral Model, Evolutionary Model., RAD Model, Agile model.	15
II	**Requirements engineering process:** Requirement Gathering and Analysis, Feasibility studies, requirements validation, requirements management. Functional and Non-Functional Requirements, User requirements, System Requirements, SRS documents. **Design Engineering:** Software design concepts, design process, design methodology, Function- oriented software design, Structured analysis, Structured Chart, DFD, Concept of Modularity, Cohesion and Coupling, OOAD (Object oriented analysis and design) Concept, UML diagram, different view of software using UML diagrams, Class diagram, Object	15

	diagram, Activity diagram, Interaction diagram, State chart diagram.	
III	**Software Project Management:** Need of Software project management, Software project managements complexities, Types of management in SPM, Project Planning, Software project scheduling, Project size, estimation: LOC, Function Point. Project estimation techniques: Empirical, Analytical and Heuristic technique, COCOMO models.	**15**
IV	**Testing Strategies and Quality Management:** Testing Strategies for software, black-box and white-box testing, Verification and Validation, Unit-testing, Integration and system testing, Debugging approach. **Software Reliability & Quality Management:** Software Reliability, Quality concepts, software quality assurance, software reviews, formal technical reviews, software configuration management, software reliability, the ISO 9000 quality standards. Capability Maturity Model. Risk Management.	**15**
Keywords	Software, software Engineering. Models, Requirement engineering, Software Designing Tools, Testing	

Name and Signature of Convener & Members of CBS

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Rajib Mall, Fundamentals of software Engineering, 5th ed, PHI Publication.
- Roger S. Pressman, Software Engineering, A practitioner's approach, 6th edition, McGraw Hill international Edition.

Reference Resources:.

- Sommerville, Software Engineering, 7th edition, Pearson Education.
- James Rumbaugh, Ivar Jacobson, The Unified Modeling Language user guide Grady Booch, Pearson Education.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x10=40 marks**	

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DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-III**	**Session: 2021-2025**
Course Code	**CASC-08T**		
Course Title	**Relational Database Management System**		
Course Type	**DSC (Discipline Specific Course)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**After Completing this course, students will be able to:** • Learn about Database Concepts, Architecture, various User's, Data models and Data Management. • Familiar with RDBMS Software like Oracle and MySql. • Create various Tables and Database. • Explore various SQL Commands. • Create Database on the basis of E-R diagrams for Minor and major Project.		
Credit Value	**3 Credits**	**Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-60 Periods (60 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Overview of Database Management:** Introduction, Data Processing versus Data Management, Data Models: Network Model, Relational Model, Hierarchical Model, Instance and schema, View of Database system, File Oriented Approach vs Database Oriented Approach, Data Independence, DBMS Architecture, Database Administration Roles, Database languages: DDL, DML, DCL, TCL, Different kinds of DBMS users, Introduction to Data Dictionary.	12
II	**Database Design and E-R Model:** Introduction, Entity, Strong and weak entities, Relationship, Cardinality, Attributes, Concept of keys: Super key, Candidate key, Primary key, Alternate key, Foreign key ER Diagram Constraints in Database, Codd's Rules, Extended ER features: Generalization, Specialization and Aggregation, Participation, Converting an E-R model into relational Schema.	11

III	**Relational Database Design and Operations:** Introduction, Dependencies: Functional dependencies, Multivalued Dependencies, Join dependencies, Database anomalies, Decomposition, Normalization: Normal forms 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, De-normalization. Relational Algebra: Select operation, Project operation, Union operation, Cartesian Product operation, Intersection operation, Join operation, Different types of joins (Inner join, Outer join, Self join).	**11**
IV	**Transaction:** Introduction, control techniques, Desirable properties of transaction (ACID), Concurrency control techniques, Serializability.	**11**
Keywords	Data Models, Data Dictionary, E-R Model, E-R Diagram, Keys. Functional Dependency, Anomalies, Normalization, Relational Algebra, Concurrency. Serializability	

Name and Signature of Convener & Members of CBS

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Database system concept, H. Korth and A. Silberschatz, TMH publication.
- Database Management system, Alexies& Mathews, vikash publication.
- Database Management System, C.J. Date, and Narosha publication.
- Database management system By James Matin.

Reference Books Recommended:

- Principles of Database System by Ullman.
- PROGRAMME Design, Peter Juliff, PHI Publication.
- The Complete Reference, Kevin Loney, Oracle Press.
- SQL,PL/SQL the PROGRAMMEming language of oracle, Ivan Bayross, PustkKosh Publication
- Microsoft SQL server Management and Administration, Ross, STM publication.

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x10=40 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)	**Semester-III**	**Session: 2021-2025**	
Course Code	**CASC-09T**		
Course Title	**Programming in Java**		
Course Type	**DSC (Discipline Specific Course)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Understand fundamentals of java Programming environment. • Understand the importance of features of java Programming. • Create user defined classes/interface and 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. • Familiar about apple, thread and servlet life cycle which helps them to develop important application for internet users.		
Credit Value	**3 Credits**	**Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
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 its types. Operators, conditional and looping statements, various packages, introduction of class, objects and methods, nested and inner class, string handling, constructor and its types.	12
II	**Inheritance:** concept of super and sub class, types of inheritance, Polymorphism: method overloading, method overriding: abstract class, constructor in multilevel inheritance, using final with inheritance. **Interface:** defining and implementing interface, extending interface, nested interface, importance of interface in java. **Package:** defining package, rules for creating a new package, concept of class-path, access protection, importing package	11

III	**Exception Handling and Multithreading:** using try and catch, multiple catch classes, nested throw, throws and finally, types of exception: built in exception, try statements. Checked/unchecked exception, creating own exception class. **Java Thread Model:** main thread, creating own thread, life cycle of thread, thread priorities, synchronization, inter thread communication, suspending, resuming and stopping thread	**11**
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.	**11**
Keywords	Java Virtual Machine (JVM), Java Development Kit (JDK), Interface, Package, Threads, Applet, AWT	

Name and Signature of Convener & Members of CBoS

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Naughton P and Schildt H., Osborne, The Complete Reference, McGraw-Hill, Berkeley Publication.
- James R. Laverick, An Introduction to java Programming, Firewall media Publication.

Reference Books Recommended:

- E. Balagurusamy, Java Programming, McGraw-Hill Publication.
- Rashmi Kanta Das, Core Java for beginners, Vikash Publication.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type qts, 1 out of 2 from each unit-4x10=40 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-III**	**Session: 2021-2025**
Course Code	**CASC-08P**		
Course Title	**Lab 5: Relational Database Management System (Oracle / MySQL)**		
Course Type	**Practical**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Learn about database concepts, architecture various Users Data Model and Data Management which helps them to interact with various Databases. • Develop various tables and database which helps them to develop new software. • Practice various SQL commands which help them to generate new relationships among various tables and database which are useful for software development. • Familiar with RDBMS software like oracle and SQL server which are used as backend for software development. • Develop new database for their minor and major project development which enhanced their data storage, data accessibility and data management.		
Credit Value	**1 Credits**	**Credit-30 Hours – Lab practical's & training**	
Total Marks	**Max. Marks:50**	**Min marks -20**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Module	Topics(Course Content)	No. of Period
List of Practical Experiments	1. Design an employee table in Oracle/SQL Server having eid(primary key) ename, edesignation, edoj, edob, eaddress, salary, econtact as fields and answer the following questions a. Insert five records in above created table. b. Display all five records. c. Delete the fourth record. d. Update the third record of the field ename as "hari". e. Add one new field in the table. 2. Design a salary table Oracle/SQL Server with one primary key and foreign key (employee table) having following fields: Month, working days, deptid, gross, incentive, deduction and net salary. a. Insert five records in the above created table. b. Display all five records.	**30**

	c. Use foreign key relations and display records d. Update the second record of field deptid as 'Sales'. e. Add one new field in the table. 3. Create a new user in Oracle/SQL Server. 4. Create a view in Oracle/SQL Server. 5. Create a new table in Oracle/SQL Server and practice for join operation. 6. Create a new user in Oracle/SQL Server and practice for the commit and rollback command. 7. Create a new database in Oracle/SQL Server having at least five tables for the Hotel Management System. 8. Create a new database in Oracle/SQL Server having at least four tables for Covid Vaccination Management System. 9. Create a new database in Oracle/SQL Server having at least five tables for the Library Management System. 10. Create a new table in Oracle/SQL Server and practice for Group by and Order by Clause. 11. Create a new table in Oracle/SQL Server and practice for max(), min(), avg() and count(functions. 12. Create a new table in Oracle/SQL Server and practice for lower(), substr(),trim() and upper(functions. 13. Create a new table in Oracle/SQL Server and practice for unique and check constraints. 14. Create a new table in Oracle/SQL Server and practice for any two date formats. 15. Create a new table in Oracle/SQL Server and practice using clauses. 16. Create a new table in Oracle/SQL Server and practice for having clauses with sub queries. 17. Create a new table in Oracle/SQL Server and practice for aliases in any table. 18. Create a new table in Oracle/SQL Server and practice for inner and outer join. 19. Create a new table in Oracle/SQL Server and practice for Drop command. 20. Write a PL/SQL PROGRAMME for addition of two numbers. 21. Write a PL/SQL PROGRAMME to find the factorial value of any entered number. 22. Write a PL/SQL PROGRAMME for swapping of two numbers. 23. Write a PL/SQL PROGRAMME to print the first ten Natural Numbers. 24. Write a PL/SQL PROGRAMME to generate even series upto five digits starting from 2 and sum all the terms. 25. Write a PL/SQL PROGRAMME to practice for implicit and explicit cursors. Note: Concerned teacher can remove or add additional experiment as per requirement.	
Keywords	TABLE, SQL, PL/SQL	

Name and Signature of Convener & Members of CBoS:

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

•Database system concept, H. Korth and A. Silberschatz, TMH publication.

•Database Management system, Alexies& Mathews, vikash publication.

•Database Management System, C.J. Date, and Narosha publication.
•Database management system By James Matin.

Reference Books Recommended:

•Principles of Database System by Ullman.
•PROGRAMME Design, Peter Juliff, PHI Publication.
•The Complete Reference, Kevin Loney, Oracle Press.
•SQL,PL/SQL the PROGRAMMEming language of oracle, ivanbyross, pustkKosh publication
•Microsoft SQL server Management and Administration, Ross, STM publication.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Laboratory/field skill performance: on spot Assessment A. Performed the task based on lab work- 20 marks B. Spotting based on tools & technology(written)-10 marks C. Viva-voce(based on principle/technology)- 05 marks**	**Managed by Course Teacher as per lab status**

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28) DEPARTMENT OF COMPUTER APPLICATION COURSE CURRICULUM

PART-A:Introduction

PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)	Semester-III	Session: 2021-2025

Course Code	**CASC-09P**	
Course Title	**Lab 6: Programming in Java**	
Course Type	**Practical**	
Prerequisite	**As per programme**	
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Execute the Programme in java. • Implement the concept of multi-threading. • Develop the new package which helps them to develop new application software and Utility Software. • Develop new online software and internet games with the help of Applet and AWT Packages. • Familiar about Applet, Thread and Servlet Life Cycle which helps them to develop value added services for internet Users.	
Credit Value	**1 Credits**	**Credit-30 Hours – Lab practical's & training**
Total Marks	**Max. Marks:50**	**Min marks -20**

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Module	Topics(Course Content)	No. of Period
List of Practical Experiments	1. Write a PROGRAMME to check palindrome number. 2. Write a PROGRAMME to check Armstrong number. 3. Write a PROGRAMME to check the prime number. 4. Write a PROGRAMME to calculate simple interest using the GUI Form. 5. Write a PROGRAMME to demonstrate the thread life cycle. 6. Write a PROGRAMME to show the use of applet. 7. Write a PROGRAMME to demonstrate the concept of arrays. 8. Write a PROGRAMME to find the second largest and second smallest number in array. 9. Write a PROGRAMME to perform multiplication of two matrices. 10. Write a PROGRAMME to demonstrate the concept of method overloading. 11. Write a PROGRAMME to demonstrate the concept of constructor	**30**

	overloading. 12. Write a PROGRAMME to demonstrate the concept of inner classes. 13. Write a PROGRAMME to demonstrate the concept of inheritance. 14. Write a PROGRAMME to demonstrate the concept of access specifiers in java. 15. Write a PROGRAMME to implement the concept of interface. 16. Write a PROGRAMME to show the creation of package in java. 17. Write a PROGRAMME to design the user registration form with basic registration details. 18. Write a PROGRAMME to show the exception handling process in java. 19. Write a PROGRAMME to show the significance of multithreading. 20. Write PROGRAMME to read the data from the console device and store it in any file in secondary storage. 21. Write a PROGRAMME to copy the content of any file into another file. 22. Write a PROGRAMME to demonstrate the advantages of event delegation model. 23. Write a PROGRAMME in java for command line value passing. **Note:** Concerned teacher can add additional practical exercises as per requirement.	
Keywords	Class, Object, interface, Inheritance, package, exception handling, threads, applet, AWT	

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Naughton P and Schildt H., Osborne, The Complete Reference, McGraw-Hill, Berkeley Publication.
- James R. Laverick, An Introduction to java PROGRAMMEming, Firewall media Publication.

Reference Books Recommended:

- E. Balagurusamy, Java PROGRAMMEming, McGraw-Hill Publication.
- Rashmi Kanta Das, Core Java for Beginner's, Vikash Publication.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Laboratory/field skill performance: on spot Assessment A. Performed the task based on lab work- 20 marks B. Spotting based on tools & technology(written)-10marks C. Viva-voce(based on principle/technology)- 05 marks**	**Managed by Course Teacher as per lab status**

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-III**	**Session: 2024-2028**
Course Code	**CASE 01**		
Course Title	**Cyber Security and Cyber Law**		
Course Type	**DSE (Discipline Specific Elective)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Understand the fundamental concepts in cyber security and distinguish among the attacks, threats and vulnerabilities • Identify, differentiate and explain different cyber crimes and frauds. • Understand the concept of Cyber security issues and challenges associated with it. • Understand the cyber crimes, their nature, legal remedies and how to report the crimes through available platforms and procedures. • Understand the basic concepts related to E-Commerce and digital payments.		
Credit Value	**4 Credits**	**1 Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-60 Periods (60 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Introduction:** Defining Cyberspace, Architecture of cyberspace, Internet, World wide web, Internet security, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security, Cyber Physical System Security, Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber crimes, Remedial and mitigation measures.	15
II	**Authentication:** Vulnerability and vulnerability assessment, Intrusion Detection and Intrusion Prevention System, Introduction of Authentication, User Authentication Methods, Biometric Authentication Methods.	15

III	**Different Securities:** Window Security, Smartphone Security, Browser Security, Web Security, Email Security, Wi-Fi Security, and Social Media security: Challenges, opportunities and pitfalls in online social network, Best practices for the use of Social media. Introduction to digital payments, Components of digital payment and stakeholders, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorized banking transactions.	**15**
IV	Cyber Law Basics: Information Technology At 2000-Amendments; Laws regarding posting of inappropriate content, Relevant provisions of Payment Settlement Act 2007, Cybercrimes and offenses dealt with IPC, RBI Act, IPR in India.	**15**
Keywords	Cyberspace, Cybercrime, Cyber security, Physical System security, Ransomware, Modus-operandi, Authentication, Vulnerability, Intrusion Detection and Prevention, Cyber Law.	

Name and Signature of Convener & Members of CBS

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Cyber criminology: Exploring Internet Crimes and Criminal Behavior by K. Jaishankar, CRC press.
- Data communication and Networking by B. Forouzan, TMH.
- An unofficial guide to ethical hacking by Ankit Fadia, tinity publisher,
- An ethical guide to hacking mobile phones by Ankit Fadia, trinity publisher.
- Computer Network Security and Cyber Ethics by Siva Ram Murthy, B.S. Manoj, MeFarland andCompany,INC

Reference Resources:

- Cyber Crime Impact in the New Millennium, by R. C Mishra, Auther Press. Edition 2010.
- Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit
- Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 201 1)
- Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson, 13th November, 2001)
- Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
- Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publisher.
- Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt, Ltd
- Fundamentals of Network Security by E. Maiwald, McGraw Hill.

Online Resources:

- Cyber Security from SWAYAM: https://onlinecourses.swayam2.ac.in/cec21_cs09/preview
- Introduction to Cyber Security from SWAYAM: https://onlinecourses.swayam2.ac.in/nou20_cs01/preview
- Cyber Security for Beginners: https://heimdalsecurity.com/pdf/cyber_sccurity_for_beginners_ebook.pdf
- Cyber Criminology by K. Jaishankar: https://larosc.staff.ub.ac.id/files/201 1/12/Cyber-Criminology-Exploring-Internet-Crimes-and-Criminal-Bchavior.pdf
- Fundamental of Cyber Security by Dr. Jitendra Pandey: http://www.uou.ac.in/sites/default/files/slm/FCS_pdf
- Information Technology Act 2000: https://wwww.meity.gov.in/content/information-technology-act-2000

- Information Technology Act: https://www.meity.gov.in/content/information-technology-act
- Cyber Crime Law and Practice: https://www.icsi.edu/media/webmodules/publications/Cyber_Crime_Law_and_Practice.pdf

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type question, 1 out of 2 from each unit- 4x10=40 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DISASTER MANAGEMENT
COURSE CURRICULUM

PART-A:Introduction

PROGRAMME: Department of Science (BCA, B.Sc., FD, FS) (Certificate/Diploma/Degree Honors)	Semester-III	Session:2024-2028

Course Code	**DUVAC-03**	
Course Title	**Disaster Management**	
Course Type	**VAC (Value Addition Course)**	
Pre-requisite(if any)	**As per PROGRAMME**	
Course Learning Outcomes (CLO)	At the end of this course, student will be able to: A. Explain Emergencies and controls, with examples of industrial disasters and their consequences. B. Describe the elements of emergency planning and preparedness. C. Summarize the causes of natural disasters, mitigation of their effects, rescue, relief and rehabilitation. D. Explain the disaster management mechanism and capacity building concepts	
Credit Value	**2 Credits**	**Credit = 15 Hours – Learning &Observation**
Total Marks	**Max. Marks:=50**	**Min PassingMarks:20**

PART-B: Content of the Course

TotalNo.ofTeaching-learningPeriods (45 min perperiod)-30Periods(30 Hours)

Unit	Topics(Course Contents)	No. of Period
I	**Definition and types of disaster** Hazards and Disasters, Risk and Vulnerability in Disasters, Natural and Man-made disasters, earthquakes, floods drought, landside, land subsidence, cyclones, volcanoes, tsunami, avalanches, global climate extremes. Man-made disasters: Terrorism, gas and radiations leaks, toxic waste disposal, oil spills, forest fires.	8
II	**Study of Important disasters** Earthquakes and its types, magnitude and intensity, seismic zones of India, major fault systems of India plate, flood types and its management, drought types and its management, landside and its managements case studies of disasters in Sikkim (e.g.) Earthquakes, Landside). Social Economics and Environmental impact of disasters.	7
III	**Mitigation and Management techniques of Disaster** Basic principles of disasters management, Disaster Management cycle, Disaster management policy, National and State Bodies for Disaster Management, Early Warming Systems, Building design and construction in highly seismic zones, retrofitting of buildings.	8
IV	**Training, awareness PROGRAMME and project on disaster management** Training and drills for disaster preparedness, Awareness generation PROGRAMME, Usages of GIS and Remote sensing techniques in disaster management, Mini project on	7

	disaster risk assessment and preparedness for disasters with reference to disasters in Sikkim and its surrounding areas.	
Keywords		
Signature of Convener & Members (CBoS)		

PART-C: Learning Resources

Text Books, Reference Books and Others

A. Disaster Management Guidelines, GOI-UND Disaster Risk PROGRAMME (2009-2012) 2. Damon, P. Copola, (2006)

B. Introduction to International Disaster Management, Butterworth Heineman.

Reference Books

- Gupta A.K., Niar S.S and Chatterjee S. (2013) Disaster management and Risk Reduction, Role of Environmental Knowledge, Narosa Publishing House, Delhi.
- Murthy D.B.N. (2012) Disaster Management, Deep and Deep Publication PVT. Ltd. New Delhi. 5. Modh S. (2010) Managing Natural Disasters, Mac Millan publishers India LTD.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x5=20 marks Total = 35 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF SCIENCE
COURSE CURRICULUM

PART-A:Introduction

PROGRAMME: Department of Science (BCA, B.Sc., FD, FS) (Certificate/Diploma/Degree Honors)	Semester-III	Session:2024-2028

Course Code	**DUAEC-03**	
Course Title	**Environmental Studies**	
Course Type	**AEC (Ability Enhancement Course)**	
Pre-requisite(if any)	**As per PROGRAMME**	
Course Learning Outcomes (CLO)	At the end of this course, student will be able to: 1. Relate the basic concept of the environment 2. Explain environmental alterations 3. Develop skills in environmental measurement 4. Examine correction measures of the environment	
Credit Value	**2 Credits**	**Credit = 15 Hours – Learning &Observation**
Total Marks	**Max. Marks:=50**	**Min PassingMarks:20**

PART-B: Content of the Course

TotalNo.ofTeaching-learningPeriods (1 hours perperiod)-30Periods(30 Hours)

Unit	Topics(Course Contents)	No. of Period
I	**Basic Composition:** 1. Abiotic and Biotic components of the environment 2. Biodiversity Concept, types, and measures about its protection 3. Basic concept of Bio-Geo Chemical Cycle 4. Energy Flow in an ecosystem	8
II	**Alterations in Environment** 1. Concept and components of the pond ecosystem 2. Air pollution and measures for its control 3. Water pollution and measures for its control 4. Global warming, Climate change, and possible measures	7
III	**Measurements of Environmental Components** 1. Soil composition and methods of its analysis 2. Water analysis methods for DO, BOD, COD 3. Water analysis methods for pH, TDS, Turbidity, Salinity, and Alkalinity 4. Information about environmental factors-PM-10, PM-2.5, NO_2, 0_3	8
IV	**Application Measures** 1.Useful microbes to control water pollution 2. Useful microbes to control soil pollution 3. Concept of Biodegradation 4. Concept of Phytoremediation	7

Keywords	Ecosystem, Pollution, Climate Change, Biodegradation
Signature of Convener & Members (CBoS)	

PART-C: Learning Resources

Text Books, Reference Books and Others

1. Ecology and Environment, 8th Edition, P.D.Sharma, Rastogi Publication, Meerut.
2. Environmental Biology, 2nd Edition, P,D.Sharma, Rastogi Publication, Meerut.
3. Environmental Biology and Toxicology, 2nd Edition, P.D.Sharma, Rastogi Publication, Meerut.
4. Environmental Studies, 1st Edition, S.V.S.Rana, Rastogi Publication, Meerut.
5. Environmental Biotechnology, 1" Edition, S. V. S. Rana, Rastogi Publication, Meerut

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x5=20 marks Total = 35 marks**	

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BCA

SEMESTER-IV

Programme Curriculum

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SEMESTER IV

S.NO	COURSE CODE	COURSE TITLE	TEACHING HOURS PER WEEK				EXAMINATION SCHEME				
							THEORY		PRACTICAL		TOTAL MARKS
DISCIPLINE SPECIFIC COURSE			L	T	P	C	EX	IN	EX	IN	
1.	CASC-10	Theory of Computation	3	1	0	4	70	30	-	-	100
2.	CASC-11T	Web Technology	3	-	0	3	70	30	-	-	100
3.	CASC-12T	Python Programming	3	-	0	3	70	30	-	-	100
GENERAL ELECTIVE											
4.	DUHISC-02	History of India starting to 2nd Century B.C.	4	-	0	4	70	30	-	-	100
DISCIPLINE SPECIFIC ELECTIVE											
4.	CASE-02	Artificial Intelligence and Expert System	4	-	0	4	70	30	-	-	100
SKILL ENHANCEMENT COURSE											
5.	CASEC-02	Green Technology	2	0	0	2	35	15	-	-	50
ABILITY ENHANCEMENT COURSE											
6.	AEC-04	Communicative English and Soft Skills	2	0	0	2	35	15	-	-	50
PRACTICAL LAB											
7.	CASC-11P	Lab 7: Web Technology	-	-	2	1	-	-	35	15	50
8.	CASC-12P	Lab 6: Python Programming	-	-	2	1	-	-	35	15	50
Total Credit: 20							Total Marks: 600				

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-IV**	**Session: 2024-2028**
Course Code	**CASC-10**		
Course Title	**Theory of Computation**		
Course Type	**DSC (Discipline Specific Course)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Understand of the language compiler and their associated phases. • Understand of the core concepts in automata theory and formal languages. • Understand and analyzing the fundamentals of compiler design. • Design grammar and automata for different language classes. • Design the pushdown automata and Turing machine.		
Credit Value	**4 Credits**	**Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-60 Periods (60 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Introduction to Language Compiler:** What is a compiler, phases of a compiler, the role of lexical analyzer, specification of tokens, recognition of tokens; different types of parsers; types of grammars, and their associated language in theory of computation. **Finite Automata:** Introduction to Finite State Automata (FSA): Formal definition, Representation notations (state transition diagram, transition table). Types of FSA: Deterministic Finite Automata (DFA), Nondeterministic Finite Automata NFA), Finite Automata with Epsilon Transitions, Elimination of Epsilon transitions, Conversion of NFA to DFA, Equivalence of NFA and DFA. Applications of Finite Automata, Minimization of Deterministic Finite Automata. Mealy machine, Moore machine.	**15**
II	**Regular Expressions:** Introduction to RE, Identities of Regular Expressions, Finite Automata and Regular Expressions- Converting from DFA to Regular Expressions, Converting Regular Expressions to Automata, Applications of Regular Expressions. **Regular Grammars:** Definition, Regular grammar, and FA, FA for regular grammar, Regular grammar for FA. Proving languages to be non-regular -Pumping lemma, applications, Closure properties of regular languages.	**15**

III	**Context Free Grammar:** Introduction to CFGs, Properties of CFGs, Derivation Trees Sentential Forms, Rightmost and Leftmost derivations of Strings. Ambiguity in CFG, Minimization of CFG, Chomsky Normal Form (CNF), Greibach Normal Form (GNF), Pumping Lemma for CFLs. **Pushdown Automata:** Introduction of PDA and its model, types of PDA, Languages accepted by the PDA, Acceptance by Final State and Acceptance by Empty stack and its Equivalence, Equivalence of CFG and PDA.	**15**
IV	**Turing Machines:** Formal definition and model of Turing Machine, Types of TMs, Languages of a TM, TM as acceptors, Properties of recursive and recursively enumerable languages, Universal 'Turing machine, The Halting problem, Undecidable problems about TMs. Context- sensitive language and linear bounded automata (LBA).	**15**
Keywords	Language compiler, grammar, and their associated language, Finite Automata, Regular Expression, Grammar, Context Grammar, and Turing Machine.	

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- John E. Hopcroft, Rajveer Motwani Jeffrey D.Ullman, Introduction to automata theory languages and computation 3rd edition, Pearson education, India.
- K. L. P Mishra, N. Chandrasekaran , theory of Computer Science Automata Languages and computation, 2nd edition, Prentice Hall of India.
- Tools Alfred v. AHO Ravi Sethi, D. Jeffrey Ullman and Monica S. Lam, Compiler's Principles Techniques and tools, Addison Wesley.

Reference books:

- A.M. Padma Reddy, Finite Automata and formal Languages, Pearson Education India.
- Michael sipser, third edition, introduction to the theory of computation.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x10=40 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024- 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)	**Semester-IV**	**Session: 2024-2028**	
Course Code	**CASC-11T**		
Course Title	**Web Technology**		
Course Type	**DSC (Discipline Specific Course)**		
Prerequisite	As per PROGRAMME		
Course Learning Outcomes (CLO)	After Completing this course, students will be able to: • Analyze a web page and identify its elements and attributes. • Create web pages using, HTML, CSS, JavaScript, XHTML. • Build Dynamic web pages using JavaScript. • Create XML Documents and schemas. • Build Intractive web applications using PHP, AJAx. • Handling MySql Database using PHP.		
Credit Value	**3 Credits**	**Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Introduction:** Fundamentals of web technology: Webpages, website, browser, client, web servers, Basics of HTML CSS, Scripting Languages, MySQL, PHP etc., protocols governing the web, Web applications. Web Publishing: Introduction, Domain Name Registration, choosing a web host and signing up for an Account, web hosting. IDE for web development.	**12**
II	**HTML:** Introduction, Basic formatting tags: heading, paragraph, line breaks, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size, Navigation Links using anchor tag: internal, external, mail and image links, Link to different web pages and sections. Lists: ordered, unordered and definition, Table tag, Image tag, iframe tag. HTML Form controls: form, text, password, text area, button, checkbox, radio button, select box, hidden controls, Frameset and frames. Basics of DHTML, introduction of XML and its uses. Introduction of AJAX.	**11**

III	**CSS Scripting Languages:** Introduction and features of CSS, CSS syntax, Creating CSS Style sheets, CSS selectors (simple selector, combination selectors, pseudo-class- selectors, pseudo-element-selectors, attribute selector), different ways to insert the CSS, different styling attributes and their settings like color, background, font, text, margin, position, border etc. **JavaScript:** introduction and features of java script, Syntax & Conventions, Variables, Expression, Branching Looping, Function, Array. Objects, Events and Document Object model, Alerts, prompts and conforms.	**11**
IV	**PHP:** Introduction and features of PHP, data types, operators, control statements and looping, functions, array, string and string functions, object oriented, PROGRAMMEming features of PHP: class- objects, abstraction, encapsulation, constructor, destructor, inheritance, polymorphism etc. Exception Handling. Handling HTML forms with PHP, Working with files and directories, session and cookies, PHP functions for Database Connectivity and basic operation with MySQL.	**11**
Keywords	Webpage, HTML, AJAX, CSS, JavaScript, PHP, MySQL.	

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books, Reference Books and Others

Text Books Recommended:

- Xavier,C, Web Technology and Design, New Age International.
- Ivan Bayross, HTML, DHTML, Java Script, Perl & CGI, BPB Publication.
- Ramesh Bangai, Internet and web design, New Age International.
- Ullman, PHP for the Web:Visual QuickStart guide, Pearson Education.

Reference Books Recommended:

- Jim Converse &Joyce park, PHP &MySQL Bible, Wiley India Publication.
- Chuck Musiano& Bill Kenndy, O Reilly, HTML The Deinitive Guide.
- Joseph Schumuller, Dynamic HTML BPB 2000
- Dietel, DeitelGodberg, Internet and WWW to PROGRAMME, Pearson Education.
- Raj Kamal, Internet and Web Technology, Tata McGraw-Hill.

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks

Continuous Internal Assessment (CIA): 30 Marks.

End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x10=40 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction

PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)	Semester-IV	Session: 2024-2028

Course Code	**CASC-12T**	
Course Title	**Python Programming**	
Course Type	**DSC (Discipline Specific Course)**	
Prerequisite	**As per PROGRAMME**	
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Define the structure and components of a python PROGRAMME. • Demonstrate proficiency in handling of loops and creation of function. • Discover the commonly used operation involving regular expressions and system. • Determine the need for scrapping websites and working with CSV JSON and other file formats. • Interpret the concepts of object orientedProgramming as used in python.	
Credit Value	**3 Credits**	**Credit-15 Hours - Learning & Observation**
Total Marks	**Max. Marks:100**	**Min marks -40**

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Introduction to Python Programming:** What is a PROGRAMME, Formal and Natural Languages, Why use Python, Uses of python, Strengths & Drawbacks, The Python Interpreter, Running Python, The IDLE User Interface, The Interactive Prompt, Script Mode, Dynamic Typing, Debugging. **Types, Operators, Expressions & Statements:** Values and Types. Assignment Statement, Variable Names, Expressions & Statements, Order of Operations, String Operations, Comments.	10
II	**Conditionals:** Boolean Expressions, Logical operators, Conditional & Alternative Execution, Reassignment, Updating Variables, The "for and Chained and Nested Conditions. **Iterations:** 'while" statements, break. **Strings:** String is a sequence, len, Traversal with a for loop, String Slices, Searching, Looping and Counting, String Methods, the "in" operator, String Comparison.	10
III	**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 10 values, Traversing Dictionaries.	10

IV	**Function, Files and Graphics:** Defining a function, calling function, Types of functions, Function Arguments, Anonymous functions, Global and local variables, **Files:** Files & Persistence, Reading and Writing, Filenames and Paths. **Graphics Programming:** Drawing with turtle graphics, using turtle module, moving the turtle with any direction, moving 15 turtle to any location, the color, bgcolor, circle and speed method of turtle, drawing with colors, drawing basic shapes using iterations. **Python Libraries:** Exploring python libraries like Panda, Numpy, TensorFlow, Scikit-Learn, Keras, PyTorch, SciPy etc.	**15**
Keywords	List, Tuple, Dictionary, Panda, Numpy, TensorFlow- Scikit-Learn, Keras, PyTorch, SciPy	

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:
Reference Books Recommended:
Online Resources:

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A:Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type qts, 1 out of 2 from each unit-4x10=40 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction

PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)	Semester-IV	Session: 2021-2025

Course Code	**CASC-11P**	
Course Title	**Lab 7:Web Technology**	
Course Type	**Practical**	
Prerequisite	**As per PROGRAMME**	
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Analyze a web page and identify its elements and attributes. • Create web pages using, HTML, CSS, JavaScript, XHTML. • Build Dynamic web pages using JavaScript. • Create XML Documents and schemas. • Build Interactive web applications using PHP, AJAX. • Handling MySQL Database using PHP.	
Credit Value	**1 Credits**	**Credit-30 Hours – Lab practical's & training**
Total Marks	**Max. Marks:50**	**Min marks -20**

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Module	Topics(Course Content)	No. of Period
List of Practical Experiments	**HTML** 01. Write HTML code to create the following table:	**30**

Class	Subject 1	Subject 2	Subject 3
BCA-I	Visual Basic	PC Software	Electronics
BCA-II	C++	DBMS	English
BCA-III	Java	Multimedia	CSA

02. Write HTML code to create the following lists: ◦
- C
- C++
- Fortran
- COBOL

03. Write HTML code to create the following
i. Java
ii. Visual Basic
iii. Basic

iv. COBOL

04. Write HTML code to demonstrate hyper linking between two web pages.
05. Create a marquee & also insert an image.
06. Write HTML code to create a frame in HTML with 3 columns (width= 30%, 30%, 40%) and put hyperlinked pictures inside each.
07. Write HTML code to create a webpage with a blue background and print the following text with white background. "Hello Word"
08. Write HTML code to create the following table:

Course	General	OBC	EWS	SC/ST	Total
Computer Science	9	18	5	5	37
Commerce	14	25	6	5	50
Grand Total					87

09. Write HTML code to create the following table:

Maruti		Tata		Ford	
Model	Price	Model	Price	Model	Price
Maruti 800	2 Lac	Sumo	2 Lac	Ion	5 Lac
Omni	3 Lac	Scorpio	2 Lac	Gen	2 Lac

10. Write HTML code to create the following table:

Shri Davara University		
Name	Roll No.	Class
Rahul	40	BCA -I
Preeti	85	BCA -I
Priya	74	BCA -I
Richa	95	BCA -I

11. Write HTML code to create the following table:

STUDENTS RECORD

Name	Subjects	Marks
Arun	Java	70
	C	80
Ashish	Java	75
	C	74

12. Write HTML code to create the following table and insert an image in the webpage

Subject	Max	Min	Obtain
Java	100	33	75
Multimedia	100	33	70
Operating System	100	33	68
C++	100	33	73

13. Write HTML code to create the following table:

Name **Roll NO.**		Rahul 101	
Subject	Max	Min	Obtain
Java	100	33	75
Multimedia	100	33	70

14. Write HTML Code to create the following form:

Enter Name:

Enter Roll No:

Enter Age:

Enter DoB:

15. Write HTML Code to create the following form:

User Name:

Password:

SUBMIT

When user types characters in password field. The browser displays asterisks or bullets instead of characters.

16. Write HTML code to create Student Registration Form
17. Write HTML code to create Contact Form
18. Write HTML code to insert Audio & Video in HTML
19. Write HTML code for the following equations:

$C_2H_5OH+PCl_5=C_2H_5Cl+POCl_3+HCL$
$4H_3PO_3=3H_3PO_4+PH_3$
$PCl_3+Cl_2=PCl_5$

20. Write the HTML code to display the following list:
    - Actors
        - Bruce Wills
        - Gerand Butler
        - Vin Diesel
        - Bradd Pitt
        - Paul Walker
        - Jason Statham
    - Actress
        - Julia Roberts
        - Angelina Jolie
        - Kate Winslet
        - Cameron Diaz
21. Write the HTML code to display the following list:
    1. Cricket Players
        A) Batsman
            i. Sachin Tendulkar
            ii. Rahul Dravid
            iii. Virendra Sehwag
        B) Bowlers
            i. Kumble
            ii. Zaheer Khan
            iii. Balaji
        C) Spinner
            i. Harbhajan
            ii. Ravindra Jadeja
            iii. Kartik

****

JavaScript

01. Write a java script, to print prime numbers from 1 to 50.
02. Write a script to get the largest value in an array.
03. Write a function to calculate the factorial of a number (a non-negative integer).
04. Write a script to demonstrate data validation.
05. Write a PROGRAMME to print dates using JavaScript.
06. Write a PROGRAMME to Sum and multiply two numbers using JavaScript.

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DHTML

01. Create a web page which shows the changes of header dynamically.
02. Create a webpage which explains the use of relative positioning
03. Display an alert box to alert the x and y coordinates of the cursor.

****

PHP

01. Write script using for loop to print all integer between -10 to 10
02. Write script to construct the following pattern, using nested for loop:
    1
    12
    123

1234
12345

03. Write a PHP script to get the largest key in an array.
04. Write a function to calculate the factorial of a number (a non-negativeinteger).
05. Write a PHP script to check string for palindrome
06. Write a PHP script to collect the data from the registration form designed in HTML, and submit it to the database.
07. Write a PHP script to read the data from the database and display It into the web page in tabular form.

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My-SQL

Task -I

Create the following table in MySQL:

College (cname, city, caddress, phone)
Staffjoins (sid, cname, dept, doj, post, salary)
Staffs (sid, sname, saddress, scontacts)
Teaching (sid, class, paprid, fsession, tsession)
Subject (paperid, subject, paper, papername)

Write the queries to perform the following operations.

01. List the name and post of a teacher teaching a computer subject.
02. List the name and city of all staff working in your college.
03. List the name and city of all staffworking in your college who earn more than 15000.
04. Find the staff whose date of joining is 2005
05. Find the staff whose names start with “M" Or “R” and 'A' and/or 7 characters long.
06. Modify the database so that staffN1 now works in C2 college.
07. List maximum, average, minimum salary of each college.
08. Acquire details of staff by name in a college or each college.
09. List names of staff in ascending order according to salary who are working in all colleges.
10. Find the staff that earns a higher salary who earn greater than the average salary of their college.

Task-II

Create the following table MySQL:

Enrollment (enrollno, name, gender, DOB, address, phone)
Admission (adno, enrollno, course, yearsem, date, cname)
Feestucture (course_yearsem, fee)
Payment (billno, admno, amount, pdate,purpose)

Write the queries to perform the following operations.

1. Get full details of all students who took admission this year class wise.
2. Get details of students who took admission in sai colleges.
3. Calculate the total amount of fees collected in this session.
4. List the students who have not paid full fees in your colleges.
5. List the number of admission in your college every year.
6. List the students in colleges in your city and also live in your city.

Task - III

Create the following table MySQL:

Subject (paperid, subject, paper, papername)
test(paperid,tdate,max,min)
score(rollno,paperid,marks,attendance)
students(admno,rollno,class,yearsem)

Write the queries to perform the following operations.

1. List roll no of students who were present in a paper of a subject.
2. List all roll numbers who have passed in first division.
3. List all students in BCA-II who have scored higher than average in your college

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Xavier,C, Web technology and design, new age international.
- Ivan Bayross, HTML, DHTML, Java Script, Perl&CGI, BPB publication.
- Ramesh Bangai, Internet and web design, New Age Inernational.
- Ullman, PHP for the web:visual QuickStart guide, pearson Education.

Reference Books Recommended:

- Jim Converse &joyce park, PHP & MySQL Bible, Wiley India Publication.
- Chuck Musiano& Bill Kenndy, O Reilly , HTML the Deinitive Guide.
- Joseph Schumuller, dynamic HTML BPB 2000
- Dietel, DeitelGodberg, Internet and WWW to PROGRAMME, Pearson Education.
- Raj Kamal, Internet and web Technology, Tata McGraw-Hill.

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Laboratory/field skill performance: on spot Assessment** **A. Performed the task based on lab work- 20 marks** **B. Spotting based on tools & technology(written)-10marks** **C. Viva-voce(based on principle/technology)- 5 marks**	

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Established under Chhattisgarh Private Universities (Establishment and Operation) Act, 2005

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction

PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)	Semester-IV	Session: 2024-2028

Course Code	**CASC-12P**	
Course Title	**Lab 8: Python Programming**	
Course Type	**Practical**	
Prerequisite	**As per PROGRAMME**	
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Define the structure and components of a python PROGRAMME. • Demonstrate proficiency in handling of loops and creation of function. • Discover the commonly used operation involving regular expressions and system. • Determine the need for scrapping websites and working with CSV JSON and other file formats. • Interpret the concepts of object orientedProgramming as used in python.	
Credit Value	**1 Credits**	**Credit-30 Hours – Lab practical's & training**
Total Marks	**Max. Marks:50**	**Min marks -20**

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)

Module	Topics(Course Content)	No. of Period
	01. Python PROGRAMME to find the union of two lists. 02. Python PROGRAMME to find the intersection of two lists. 03. Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from to 100, for each value of c, print the corresponding Fahrenheit temperature. 04. 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). 05. Write a PROGRAMME that reads an integer value and prints --leap year or --not a leap year. 06. Write a PROGRAMME that takes a positive integer n and then produces n lines of output shown as follows For example, enter a size: 5 *	

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07. Write a function that takes an integer “n”as input and calculates the value of 1 + 1/1! + 1/2! + 1/3!+ ... + 1/n
08. Write a function that takes an integer input and calculates the factorial of that number.
09. Write a function that takes a string input and checks if it's a palindrome or not.
10. Write alist function to convert a string into a list, as in list (_abc‘) gives [a,b, c].
11. Write a PROGRAMME to generate Fibonacci series.
12. Write a PROGRAMME to check whether the input number is even or odd.
13. Write a PROGRAMME to compare three numbers and print the largest one.
14. PROGRAMME to print factors of a given number.
15. Write a method to calculate GCD of two numbers.
16. Write a PROGRAMME to create Stack Class and implement all its methods. (Use Lists).
17. Write a PROGRAMME to create Queue Class and implement all its methods. (Use Lists)
18. Write a PROGRAMME to implement linear and binary search on lists
19. Write a PROGRAMME to sort Q list using insertion sort and bubble sort.
20. Python PROGRAMME to remove the “i” th occurrence of the given word in a list where words repeat.
21. Python PROGRAMME to count the occurrences of each word in a given string sentence
22. Python PROGRAMME to check if a substring is present in a given string.
23. Python PROGRAMME to map two lists into a dictionary.
24. Python PROGRAMME to count the frequency of words appearing in a string using a dictionary.
25. Python PROGRAMME to create a dictionary with key as first character and value as words starting with that character.
26. Python PROGRAMME to find the length of a list using recursion
27. Python PROGRAMME to read a file and capitalize the first letter of every word in the file.
28. Python PROGRAMME to read the contents of a file in reverse order.
29. Python PROGRAMME 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.

Keywords	List, Tuple, Dictionary, Panda, Numpy, TensorFlow- Scikit-Learn, Keras, PyTorch, SciPy

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PART-C: Learning Resources

Text Books, Reference Books and Others

- T. Budd, Exploring python, TMH 1st Ed 2011
- Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a Computer Scientist.

Reference Books Recommended:

- Luca Massaron John Paul Mueller, Python for Data Science for Dummies.
- Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a Computer Scientist.
- Zed A. Shaw, Learn Python 3 the hard way

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Laboratory/field skill performance: on spot Assessment** **A. Performed the task based on lab work- 20 marks** **B. Spotting based on tools & technology(written)-10marks** **C. Viva-voce(based on principle/technology)- 5 marks**	

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FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-IV**	**Session: 2024-2028**
Course Code	**CASE 02**		
Course Title	**Artificial Intelligence and Expert System**		
Course Type	**DSE (Discipline Specific Elective)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Understand the Basics about Artificial Intelligence and Expert Systems. • Understand the Programming Logics in Artificial Intelligence. • Understand various search methods in Artificial Intelligence. • Understand the Knowledge about the Expert Systems. • Understand the latest developments in Knowledge systems and Tools.		
Credit Value	**4 Credits**	**1 Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks:100**	**Min marks -40**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period)-60 Periods (60 Hours) No. of Topics (Course contents)

Unit	Topics(Course Content)	No. of Period
I	**Introduction:** History, Definition of AI, Emulation of human cognitive process, elementary knowledge. Computational logic, analysis of compound statements using simple logic connectives, predicate logic, knowledge organization and manipulation, knowledge acquisition.	15
II	**AI Programming languages:** LISP and other Programming languages-introduction to LISP, syntax and numerical function, LISP and PROLOG distinction, input output and local variables, Interaction and recursion, property list and arrays alternative languages, formalized symbolic logics- properties of WFRS, non-deductive inference methods. Inconsistencies and uncertainties- Truth maintenance systems, default reasoning, closed world assumption, Model and temporary logic.	15
III	**Problems and Heuristic Search Techniques:** Problem Characteristics, Production Systems, Control Strategies, Search techniques: Breadth First, Depth-first search. Hill-climbing, Heuristics Search Techniques: Best First Search, A* algorithm. **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	15

	principal.	
IV	**Expert System:** Introduction, Application, Existing Expert systems. Components of typical expert system, Rule based system architecture. **Pattern Recognition:** Pattern recognition system- understanding speech recognition, Image transformation, low level processing, medium and high level processing, vision system architecture.	**15**
Keywords	Artificial Intelligence (AI), AI Agent, Sate Space, Production System. LISP, PROLOG, Knowledge Representation, Semantic Net, Propositional Logic, Expert System.	

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI Publication.
- Elaine Rich and Kevin Knight, Artificial Intelligence, TMH publication.
- George. F, Willan. A. Stubblefield, 'Artificial intelligence and the design of expert systems', The Benjamin Cummins Publishing Co, Inc 2nd Edition, 1992.
- V.S. Jankiraman, K. Sarukesi and P. Gopala krishnan, Foundations of Artificial Intelligence and
- Expert Systems, Macmillan Series in Computer Science.

Reference Resources:

- Vinod Chandra S.S., Anand Hareendrn S, Artificial Intelligenee and Machine learning, PHI learning private Ltd
- V.S. Jankiraman, K. Sarukesi and P. Gopala Krishnan, Foundations of Artificial Intelligence and Expert Systems, Macmillan Serics in Computer Seienee
- Russel (Stuart), 'Artificial Intelligence- Modern approach, Pearson Education series in AI', 3rd Edition, 2009.
- Eugene Charniak, Drew Mc Dermot, Introduction to Artificial intelligence", Addison Wesley Longman Inc., 2009
- Robert J Schalkoff, 'Artificial intelligence An Engineering Approach', McGraw Hill International Edition, 1990

Online Resources:

- Introduction to Artificial Intelligence from SWAYAM: https://www.youtube.com/watch?y=pKeYMlkFpRc&list=PLwdnzlV30goXaceHrFYZCJKbm_laSHcH&index=2
- Artificial Intelligence: Knowledge Representation And Reasoning from SWAYAM https://onlinccourses.nptcl.ac.in/noc24_cs14/preview
- An introduction to Artificial Intelligence from SWAYAM: https://onlinecourses.nptel.ac.in/noc24_cs08/preview
- Introduction to Artificial Intelligence from Coursera: https://www.courscra.org/learn/introduction-to-ai
- Problem Solving as State Space Search from SWAYAM: https://www.youtube.com/watch?v=fLwSSfvaJWA&list-PLwdnzlV3og0XaclrFVZCJKbm_laSHcH&index-3
- Heuristic Search from SWAYAM: https://www.youtube.com/watch?v=0awSpFyh2MY&list=PLwdnzlV3ogoXaceHrrFVZCJKbm_laSHcH&index=5
- Introduction to Artificial Intelligence: https://www.iavatpoint.com/artificial-intelligence-ai
- How to Learn Artificial Intelligence from Coursera: https://www.coursera.org/articles/how-to-learn-artificial-intelligence

- What is knowledge representation:
  https://couses.csil.mit_edu/6803/pdf/davis.pdf
- Informed Search
  https://www.youtube.com/watch?v=.R[hOvjZB8&list=PLwdnzlV3ogoXaceHrFVZCJKbm_laSHcH&index=6
- Artificial; Intelligence and Expert System:
  - https://sist.sathyabama.ae.in/sist_coursematcrial
  - https://sist.sathyabama.ac.in/sist_coursemateria/uploads/SMRA3003.pdf

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 marks
Continuous Internal Assessment (CIA): 30 Marks.
End Semester Exam (ESE): 70 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:20 & 20 Assignment /seminar-10 Total marks:-30**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 30 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-10 marks: Q2. Short answer type-5x4=20 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x10=40 marks**	

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श्री Davara University

Established under Chhattisgarh Private Universities (Establishment and Operation) Act, 2005

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF ENGLISH (AEC)
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-IV**	**Session: 2024-2028**
Course Code	**AEC- 04**		
Course Title	**Communicative English and Soft Skills**		
Course Type	**Ability Enhancement Course (AEC)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Learn deviant use of English both in written and spoken forms. • Understand the importance of communication n English. • Apply the ability to improve competence in using English language. • Analyze the importance of reading skills, • Develop language for speaking with confidence		
Credit Value	**2 Credits**	**1 Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks: 50**	**Min marks -20**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (45 min. per period)-30 Periods

Unit	Topics(Course Content)	No. of Period
I	**What is communication?** • Purpose of Communication. • Types of Communication (Verbal and Non- Verbal), • The motivating factors (Intrinsic and Extrinsic) • Barriers of Communication (Internal and External).	07
II	**Building Vocabulary** i. Use of Dictionary, ii. Building vocabulary through synonyms and antonyms, iii. Use of Phrasal Verbs, Idioms and Phrases iv. Unseen passage	07
III	**Conversation in English** (Performance Based) **A) Reading:** Very short stories (Gif of Magi, Cinderella, The Selfish Giant, Stories from Panchatantra), Newspaper reports / Fact-based articles, Diction and tone, Identifying topic sentences, Reading aloud: Reading an article/report. **B) Spoken English for the Real world and Situational Dialogues (any four)** • Call Center: Talking to service Providers, Professional Enquiries, Talking	08

	with peers/ seniors. • Bank: for opening an account (seeking information on loans/FDs/other schemes. • Office: (seeking information regarding job vacancy) • Market (asking for price of an object, discount etc), • Restaurant: (asking for the special dish, offerings in the menu and ordering for food) • At the Railway Station / Bus Station enquiry: (Arrival and departure of buses/ trains) • Hotel: Booking a room, asking tariff rate • Travel agency:-(Asking to book tickets fares, finding vacancies in hotels) C) **Greetings and Common Etiquettes:** Introducing oneself Invitation; Making Requests; Expressing Gratitude; Complimenting and Congratulating; Expressing Sympathy; Apologizing; Complaining and Expressing Regret	
IV	**Applied Riding Practice and Ethics** i. Introduction to trail riding or arena riding ii. Group riding etiquette and communication iii. Intro to jumping and dressage (optional for advanced learners) iv. Ethical treatment and welfare of horses v. Assessment through practical demonstrations and logbook maintenance **Presentation skills** (Performance Based): Effective oral presentation, Characteristics of good oral presentation. Use of quotations and anecdotes. Ways of Oral Presentation (Seminar, Viva -voce, Interview, Power Point etc.) Gestures/ Mannerism during oral presentation. Media methods used for effective oral presentation, Body Language, Attire.	**08**
Keywords	Communication, Vocabulary, Conversation, Reading, Presentation.	

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Fluency in English - Part II, Oxford University Press, 2006.
- Enrich Your English, OUP, SR Inthira and V. Saraswathi, CIEFL,1997
- Oxford A-Z of English Usage, ed. Jeremy Butterfield, OUP, 2007.
- Longman Dictionary of Common Errors, N.D. Turton and J.B. Heaton, Longman, 1998
- Contemporary Communicative English, S Chand
- Malhotra Prerna, Deb DulalHalder,(2019) Communication Skills: Theory and Practice, Eighth Edition,
- BookAge Publications, New Delhi.

Online Resources:

- Applying Communication Theory for Professional Life: A Practical Introduction. Dainton andZelley, http://tsime.uz.ac.zw/claroline/backends/download.php/url-L0ludHJvX3RvX2NvbWl1bmliYXRpb2Sf
- https://web.sol.du.ac.in/my_modules/type/cbcs-4l=2ldata/root/B.Com/Semester%20ABILITY-ENHANCEMENT 20COMPU_ SORY%20COURSE-AECC/English%20Communication%20A-B-C/Unit%201-5.pdf
- https:/larchive.ore/details/personality-development-book/mode/1up

- https://www.coursera.org/articles/presentation-skills
- https://eniaminball.com/blogleood-body-lanzuage-best-visual-aid-falks/
- https://www.cbs.de/en/blog/15-effective-presentation-tips-to-improve-presentation-skills/
- https://blow.moderngeoy.com/importance-of-body-language-in-presentations-good-bad-examples

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x5=20 marks Total = 35 marks**	

Name and Signature of Convener & Members of CBoS.

श्री Davara University

Established under Chhattisgarh Private Universities (Establishment and Operation) Act, 2005

FOUR YEAR UNDERGRADUATE PROGRAMME (2024-28)
DEPARTMENT OF SCIENCE (SEC)
COURSE CURRICULUM

PART-A:Introduction			
PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)		**Semester-IV**	**Session: 2024-2028**
Course Code	**CASEC- 04**		
Course Title	**GREEN TECHNOLOGY**		
Course Type	**Skill Enhancement Course (SEC)**		
Prerequisite	**As per PROGRAMME**		
Course Learning Outcomes (CLO)	**At the end of this course, the students will be able** • Analyze green technology systems using sustainability metrics and life-cycle assessment. • Evaluate emerging technologies for carbon capture, renewable energy, and waste valorization. • Design integrated solutions addressing environmental challenges with economic viability. • Critically assess policy, market, and social dimensions of green technology deployment. • Communicate technical concepts to diverse stakeholders using evidence-based approaches		
Credit Value	**2 Credits**	**1 Credit-15 Hours - Learning & Observation**	
Total Marks	**Max. Marks: 50**	**Min marks -20**	

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (45 min. per period)-30 Periods

Unit	Topics(Course Content)	No. of Period
I	**Foundations of Green Technology &Sustainability: -** ➢ Concepts of Green Chemistry, ➢ Green Engineering, and Process Intensification. **Understanding Sustainable Development: -** ➢ Ecological, Economic, and social dimensions. ➢ Systems perspective and intergenerational justice in sustainability.	08
II	**Green Synthesis, Catalysis & Nanotechnology: -** ➢ Green oxidation, photochemical reactions,	07

	➢ Microwave and Ultrasound-assisted reactions. ➢ Synthesis of Green Reagents and Solvents. ➢ Introduction to Green nanotechnology and the role of Ionic liquids.	
III	**Green Infrastructure & Built Environment: -** ➢ Net-zero buildings, passive design, smart materials ➢ LEED, BREEAM, GRIHA certification frameworks ➢ Urban metabolism & nature-based infrastructure **Sustainable Mobility & Transportation: -** ➢ Electric/hydrogen vehicles, charging infrastructure ➢ Sustainable aviation fuels, green shipping ➢ Mobility-as-a-Service (MaaS) & urban planning integration **Innovation Ecosystems & Scaling Strategies: -** ➢ Technology readiness levels (TRL), pilot-to-commercial pathways ➢ Green finance: ESG investing, green bonds, impact funds ➢ Public-private partnerships & innovation policy	08
IV	**Waste Valorization &Upcycling: -** ➢ Advanced recycling: chemical, enzymatic, pyrolysis ➢ Plastic-to-fuel, e-waste recovery, critical minerals extraction ➢ Industrial symbiosis & eco-industrial parks **Sustainable Materials & Green Manufacturing: -** ➢ Bio-based polymers, mycelium materials, green composites ➢ Additive manufacturing for resource efficiency ➢ Cradle-to-Cradle design & material passports **Water-Energy-Food Nexus Technologies: -** ➢ Advanced wastewater treatment (membrane bioreactors, electrochemical) ➢ Precision agriculture, vertical farming, aquaponics ➢ Resource recovery: nutrients, biogas, reclaimed water **Digital Enablers for Circularity: -** ➢ IoT for resource tracking, blockchain for supply chain transparency ➢ AI/ML for predictive maintenance & material optimization ➢ Digital twins for industrial decarbonization	07
Keywords	Precision agriculture, Additive manufacturing for resource efficiency, Synthesis of Green Reagents and Solvents.	
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PART-C: Learning Resources		

Text Books, Reference Books and Others

Text Books Recommended:

- Kumar,H.D.(1999).Introductory Phycology. Affiliated East-West.PressPvt.Ltd.Delhi.2nd edition.
- Tortora,G.J.,Funke,B.R.,Case,C.L.(2010).Microbiology:AnIntroduction,Pearson Benjamin Cummings,U.S.A.10th edition.
- Sethi, I.K. and Walia, S.K.(2011).Text book of Fungi &Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
- Aggarwal,S.K.2009.Foundation Course in Biology,A one books Pvt.Ltd.,New Delhi.
- Aneja,K.R.1993.Experiments in Microbiology,Pathology and Tissue Culture, VishwaPrakashan, New Delhi.
- AnnieRagland,2012.Algae and Bryophytes,SarasPublication,Kanyakumari,India
- Basu,A.N.1993.Essentials of Plant Viruses,Vectors and Plant diseases,New Age International,New Delhi.
- Chopra.G.L.1984.A text book of Algae, Rastogi publications, Meerut, India
- Dubey, R.C. and Maheshwari.D.K.2012.Practical Microbiology, S.Chand &Company, Pvt. Ltd., New Delhi.
- Fritsch,R.E.1977.Structure and Reproduction of Algae,Cambridge University Press,London.
- Sharma,P.D.(2011).PlantPathology.Meerut,U.P:Rastogi Publication.
- Pandey B.P.2001.College Botany Volume 1,S Chand &Company Pvt.Ltd,New Delhi.

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 marks
Continuous Internal Assessment (CIA): 15 Marks.
End Semester Exam (ESE): 35 marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal test/Quiz-:10 & 10 Assignment /seminar-05 Total marks:-15**	**Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.**
End Semester Exam (ESE):	**Two section- A&B Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks Section B: Descriptive answer type question, 1 out of 2 from each unit-4x5=20 marks Total = 35 marks**	

Name and Signature of Convener & Members of CBoS.