



Shri Sangameshwar Education Society's
Sangameshwar College, Solapur [Autonomous]
 (Affiliated to Purnashlok Ahilyadevi Holkar Solapur University, Solapur)
 Kannada Linguistic Minority Institute
NAAC Accredited with 'A' Grade (III Cycle CGPA 3.39)

STRUCTURE OF B.C.A PROGRAMME UNDER CBCS PATTERN

Faculty of Science

B.C.A- II (CBCS Pattern)

To be implemented from A.Y. 2021-2022

Structure of Undergraduate Science B.C.A- II Programme

Semester	Course		Teaching Scheme/week		
			Hours	Lectures	Credits
III	DSC-1C	OOPS with C++	4.8	6	4
		Data structures using C-I			
		Practical-II	4	5	2
	DSC-2C	Database Management System	4.8	6	4
		Software Testing & Quality Assurance			
		Practical-II	4	5	2
	DSC-3C	Web Development using PHP	4.8	6	4
		Computer Networks-I			
		Practical-II	4	5	2
	SEC-1	Ethics and Cyber law	2.4	3	2
	Total		28.8	36	20
IV	AECC-B (Environmental Studies)	Theory-I	3.2	4	NC
	DSC-1D	Core Java	4.8	6	4
		Data structures using C-II			
		Practical-III	4	5	2
	DSC-2D	MYSQL	4.8	6	4
		XML Programming			
		Practical-III	4	5	2
	DSC-3D	Angular JS	4.8	6	4
		Advanced Computer Networks			
		Practical-III	4	5	2
SEC-2	Python Programming	2.4	3	2	
	Total		28.8+3.2	36+4	20
Total Semester III and IV			57.6+3.2	72+4	40

Structure of Examination Mark Scheme of B.C.A- II (CBCS Pattern) Programme

Semester	Course		EXAMINATION			Credits
			Marks			
			CA	SE	Total	
III	DSC-1C	OOPS with C++	15	35	50	2
		Data structures using C-I	15	35	50	2
	DSC-2C	Database Management System	15	35	50	2
		Software Testing & Quality Assurance	15	35	50	2
	DSC-3C	Web Development using PHP	15	35	50	2
		Computer Networks-I	15	35	50	2
	SEC-1	Ethics and Cyber law	15	35	50	2
	Total			105	245	350
IV	AECC-B (Environmental Studies)	Theory-I	15	35	50	NC
		DSC-1D	Core Java	15	35	50
	DSC-2D	Data structures using C-II	15	35	50	2
		MYSQL	15	35	50	2
	DSC-3D	XML Programming	15	35	50	2
		Angular JS	15	35	50	2
	DSC-1D	Advanced Computer Networks	15	35	50	2
		SEC-2	Python Programming	15	35	50
	DSC-1C	Practical-II	30	70	100	2
	DSC-2C	Practical-II	30	70	100	2
	DSC-3C	Practical-II	30	70	100	2
	DSC-1D	Practical-III	30	70	100	2
	DSC-2D	Practical-III	30	70	100	2
	DSC-3D	Practical-III	30	70	100	2
	Total			300	700	1000
Total Semester III and IV			405	935	1350	40

Program Learning Outcomes of BSN (POs):

1) Analyze and apply advanced technologies to solve real world problems in aspects of computer application.

2) Apply the standard software engineering practices and strategies in software project development using the open source programming environment to deliver a quality product for business success.

3) Design solutions to complex engineering problems.

4) Apply ethical principles in project management.

5) Learn teamwork while project development.

6) Recognize the need for learning in the context of technological change.

Program Objectives

- To create a sound academic base from which an advanced career in computer application can be developed
- To train the students in Computer Skills
- Clarity on both conceptual and application-oriented skills in IT Applications.

Teaching Learning Methodology

The learning methodologies include

1. **Internal Exposure**

Lectures, Assignments, Certified Courses, EDP, Project work and Practical on Application of Software Development

2. **External Exposure**

Seminars, Industrial Visits, Development Programs

**DETAILED SYLLABUS
Of
COURSES OFFERED BY THE PROGRAMME**

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)**Course Title: OOPS with C++ (2141301)****Course Code: DSC-1C Theory-I Total Hours 30 Course Credits 2 Marks:50****Course Objectives:**

The basic objective of the course is to gain knowledge about understanding basics of object-oriented programming concepts and its implementation.

Unit No	Content	Hrs
1	Introduction to class and object. History of C++, C++ basics, cin and cout objects, Function and its types, Default argument, inline function, Defining class (class specification), Creating object, Access specifier (Visibility modes)-public, protected, private, Defining member function inside and outside the class, Static data members and static member functions, Pointer to object, Array of object, Returning objects from functions, Passing object as parameter by value, by pointer, by reference, Dynamic memory allocation (new, delete), Friend function and friend class, nesting of classes.	10
2	Constructors and Destructors Constructors, characteristics of constructor, types of constructor, Constructor overloading, Destructor, characteristics of destructor, Static polymorphism (Operator overloading), rules to overload operator; unary and binary operator overloading, overloading operator using member function and friend function.	8
3	Inheritance and Runtime Polymorphism: Introduction of inheritance, types of Inheritance- Single, Multi-level, Multiple, Hierarchical, Hybrid, Multi-path (Virtual base class), Abstract class Pointers, virtual functions and polymorphism Pointers. Pointer to base class, Pointer to derived class, Introduction of runtime polymorphism, Virtual functions- characteristics and use of virtual function, Pure virtual function- characteristics and Use, virtual destructors	10
4	Stream and Files: Introduction to streams in C++, Stream classes and File stream classes, Formatted and unformatted I/O functions and Manipulators, File Manipulations- Opening, closing, reading, writing, Appending, File opening modes-Opening files, using open() and constructor..	8

Co No	Expected Course Outcomes
1	<i>On completion of this course, the students will be able to learn:</i> concepts and implementation of object oriented programming using C++.

2	the persistency invocation in language using file handling.
3	The output formatting using manipulators.

Suggested Readings:

1. OOP in C++ ,E-balagurusamy
2. Mastering C++ by Venugopal

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)

Course Title: Data Structures using C-I (2141302)

Course Code: DSC-1C Theory-II Total Hours 30 Course Credits 2

Marks:50

Course Objectives:

The basic objective of the course is to get knowledge about understanding basic data structures and applications of data structure.

Unit No	Content	Hrs.
1	An Introduction to Data Structures: Introduction, Definition and types of Data structure. Abstract Data Type (ADT), Algorithm: Definition, characteristics of algorithm, Complexity of algorithm-Space complexity, time complexity, Big-O Notation. Design strategies of Algorithm- Divide and Conquer, Greedy Algorithm, backtracking and dynamic programming.	8
2	Stack: Introduction to Stack, representation of stack-static and dynamic, Operations of stack push, pop, display, Implementation of stack using array(Static Implementation), Applications of Stack-Conversion of infix expression to postfix expression, Conversion of infix expression to prefix expression, Matching parenthesis in an expression (Checking expression is valid or invalid), Evaluation of postfix expression, Implementation of applications of stack.	10
3	Queue: Introduction to Queue, Operations of queue- insert, remove, display, Types of Queue- Linear Queue, Circular Queue, Deque (Double Ended Queue), Priority queue. Implementation of linear queue using array(Static Implementation), Difference between stack and queue, Applications of Queue	8
4	Linked Lists: Introduction to Linked Lists, representation of linked list Difference between Array and linked list. Types of linked list-Linear linked list- Singly (Single) and Doubly (Double),Circular linked list- Singly (Single) and Doubly (Double) Operations of linked list- Creation, Insertion, Deletion, Traversing, Searching, Display, count, reverse, Implementation of all types of linked list, Implementation of stack using linked list (Dynamic stack),Implementation of queue using linked list (Dynamic queue).	10

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to learn :</i>
1	the fundamentals of data structures.
2	to identify suitable data structures for an application.
3	time and space optimization in programming languages.

Suggested Readings:

- 1.Data structures and Algorithms. Aho, Hopcroft, Ulman ,Pearson
- 2.Algorithms, data structures, Programs , Niklaus Wirth, Printice Hall
- 3.Data structures using C and C++, Tanenbaum (PHI).
- 4.fundamentals of computer algorithms, ellis horowitz sartaj sahani ,galgotia publication
- 5.Art of computer Programming ,D. E. Kunth
- 6.File Systems, Structures and Algorithms ,ThomsHorbron (PHI).

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)
Course Title: DATABASE MANAGEMENT SYSTEM (2141303)

Course Code: DSC-2C Theory-I Total Hours 30 Course Credits 2 Marks:50

Course Objectives:

The objective of the course is to introduce to database management system, Data base designing and to organize, maintain and retrieve data efficiently and effectively.

Unit No	Content	Hrs.
1	Introduction to Database Management System: Definition, Limitations of traditional file system Advantages of DBMS, Components of DBMS, Database Users Database Structure Database Architecture- 2-tier and 3 level tier architecture Instances and Schemas-3 Schema architecture Database languages, Data Independence, Data Abstraction	8
2	Database Design: Types of data models- Relational, Network, Hierarchical E-R model: entities, attributes and its types, Relationship, Relationship sets, Generalization, Specialization, Aggregation, ER-to-Relational Mapping Relational Model: Relation, Domain, Tuples, Degree, cardinality Relational Algebra operations: Select, Project, Cartesian Product, Union, Set difference, join Concept of a table,row, a tuple, & a key in a relation database.	10
3	Transaction Management & Concurrency Control: Introduction of Transaction, ACID properties, transaction states, scheduling and types, conflict and view serializability. Introduction of Concurrency Control, problems of concurrency control, Lock & its types, lock based protocols, timestamp based protocol, deadlock, deadlock handling methods.	8
4	Database recovery and Atomicity: Introduction, Failure Classification, recovery algorithms, Undo/Redo operations, Log file,log base recovery, shadow paging, recovery with concurrent transaction, checkpoints/syncpoints/ savepoints. Distributed Databases: Structure of Distributed Database, Advantages and Disadvantages of Data Distribution, Data Replication, Data Fragmentation	10

Co No	Expected Course Outcomes
	<i>On completion of this course, the students should be able to:</i>
1	understand fundamental concepts of a relational database system.
2	analyze database requirements and determine the entities involved in the system and their relationship to one another.
3	develop the logical design of the database using data modeling concepts such as entity-relationship diagrams.

Suggested Readings:

- 1.Database System Concepts, Korth Silberschetz ,McGraw-Hill Inc.,US
- 2.Fundamentals of Database Systems ,Elmsari, Navathe ,Perason

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)

Course Title: Software Testing & Quality Assurance (2141304)

Course Code: DSC-2C Theory-II

Total Hours 30

Course Credits 2

Marks:50

Course Objectives:

The objective of this course is to enable the students to understand the testing, its types, Test cases design techniques to deliver better quality of software.

Unit No	Content	Hrs.
1	<p>Introduction To Software Testing What is Software Testing, Importance or need of software testing Differences between Manual and Automation Testing. White Box Testing (WBT) : Introduction to WBT, Advantages & Disadvantages of WBT. Static Techniques: Informal Reviews, Walkthroughs, Technical Reviews, Inspection. Dynamic Techniques or Structural Techniques: Statement Coverage Testing, Branch Coverage Testing, Path Coverage Testing, Conditional Coverage Testing, Loop Coverage Testing.</p>	8
2	<p>Black Box Testing(BBT) Introduction to BBT, Advantages and Disadvantages of BBT Black Box Techniques: Boundary Value Analysis, Equivalence Class Partition, State Transition, Cause Effective Graph, Decision Table, Use Case Testing ,Experienced Based Techniques: Error guessing, Exploratory testing ,Levels of Testing Functional Testing : System Testing, Smoke Testing, Integration Testing & types - Top-Down, Bottom-Up, Non-Incremental ,Acceptance Testing-Alpha and Beta Regression Testing and types- Unit/Retest, Regional, Full Non Functional Testing : Adhoc Testing, Recovery Testing Performance Testing and types: Load Testing, Stress Testing, Volume Testing, Soak Testing.</p>	10
3	<p>Test cases design Techniques: Introduction Test Case, Types of Test Cases, Test Case Template How to write a test case with examples, Preparing Review Report. Writing Test Plan, Preparing Traceability Matrix Writing Test Execution Report and Summary Report Software Test Life cycle: Concept of Software test life cycle Software Bugs : Types of Bugs, Identifying the Bugs, Reporting the Bugs</p>	10
4	<p>Software Quality Assurance: SQA Tasks, Goals and Metrics, Software Review Techniques: Informal reviews, Formal Technical Reviews, Software Reliability. Software risk management: Definition, types of risk, risk identification-risk monitoring and management. Case study : Design test case for login page, online shopping</p>	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students should be able to understand:</i>
1	Basic concepts of software testing
2	the benefits of black box testing and white box testing.
3	Test case design.

Suggested Readings:

- 1.The art of Software Testing,Glenford J. Myers,Wiley
- 2.Lessons learned in Software Testing,CemKaner, James Bach, Bret Pettichord,Pinterest
- 3.How to Break Software: A Practical Guide to Testing,James Whittaker
- 4.A Practitioner's Guide to Software Test Design ,Lee Copeland
- 5.Software Testing Techniques, 2nd edition, Boris Beizer,Dreamtech

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)

Course Title: Web Development using PHP(2141305)

Course Code: DSC-3C Theory-I Total Hours 30

Course Credits 2

Marks:50

Course Objectives:

The main objective of this course is to develop dynamic web pages. To implement server-side scripting and client-side scripting, data base connectivity to develop dynamic web page.

Unit No	Content	Hrs.
1	Introduction to Web Development: Introduction to web applications, Client Side Vs Server Side Scripting Web Servers: Local Servers and Remote Servers, Internet Information Server(IIS),Personal Web Server(PWS) Static website vs Dynamic website development, Introduction to PHP Framework, Basic PHP syntax, Data types in PHP, Variables, Constants, operators and Expressions, printing data on PHP page, Control statements: if, switch case, for, while, do while. Arrays: Initialization of an array, Types of Arrays, Array Functions, String: Formatting String for Presentation and Storage, Joining and Splitting String, Comparing String, Matching and replace Substring, patterns, basic regular expressions, String Functions. Functions: Defining and Calling Functions, Passing by Value and passing by references, Inbuilt Functions.	10
2	Object Oriented Programming in PHP: Object oriented concepts, Define a class and objects, Class attributes, Object properties ,Object methods ,constructors and destructors ,Class constants , Static method ,Inheritance ,Abstract classes ,Exception Handling ,Final keyword ,Implementing Interface	8
3	Working With Forms: Forms controls properties, methods and events, retrieving form data with \$_POST, \$_GET and \$_REQUEST arrays, Super global variables, Super global array, importing user input, accessing user input, Combine HTML and PHP code, Using hidden fields, Redirecting the user, File upload and scripts, Validation-Server-side validation, Client-side validation (Java script) Working with Database MYSQL: Steps for PHP and MYSQL Connection, Creating Tables, Inserting, deleting and updating data to a table, displaying returned data on Web pages, Finding the number of rows from table.	10
4	State Management: Cookies: Setting time in a cookie with PHP, Deleting a cookie, Query String: Working with the query string Session: Starting a session, Registering Session variables, working with session variables, destroying session, passing session Ids, encoding and decoding session variables.	8

Co No	Expected Course Outcomes
1	design and develop dynamic, database-driven web applications using PHP.
2	learn Server and Client-side validations in PHP.
3	learn Object Oriented PHP.

Suggested Readings:

- 1.PHP: The Complete Reference ,Steven Holzner. McGraw Hill
- 2.Professional PHP 5-Ed, Lecky
- 3.Thompson,HeowEide - Goodman, Steven D. ,Nowicki Wrox
- 4.Programming PHP ,Rasmuslerdorf, Kevin Tatroe,Oreilly
- 5.Learning php, mysql, javascript and css,Robin Nixon ,OreillyHill.

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)

Course Title: Computer Networks-I (2141306)

Course Code: DSC-3C Theory-II Total Hours 30 Course Credits 2 Marks:50

Course Objectives: The main objective of this course is to get knowledge about the different types of networks, working of network, wired technology and wireless technology.

Unit No	Content	Hrs.
1	Introduction to Data Communication & Networking Data Communication: Components, Data Representation, Data Flow Communication Model, modes of communication Computer Network: Introduction of Network, Uses of computer network, Network Components: Hubs, Switches, Repeaters, Bridges, Routers, Gateways, N/W Topologies, Types of Networks, Inter-networking	10
2	Network Models Protocols & Standards, Protocol Hierarchies, Design Issues of Layers, Services Primitives, Connection oriented and connectionless services Reference Model: ISO-OSI reference model, TCP/IP reference model.	8
3	Physical layer: Signals-Analog & Digital Signals, Period, Frequency, Phase, Amplitude, Bandwidth, Bit Rate, Bit Length Transmission Impairment: Attenuation, Distortion, Noise Transmission Media: i) Guided Media -Magnetic Media, Twisted Pair,Coaxial Cable, Fiber Optic Cable ii) Unguided Media - Wireless Radio Waves Microwaves, Infrared, Satellite Communication, Wireless LAN,Bluetooth Analog Transmission -Modem, Transmission Mode -Parallel, Serial, Synchronous Transmission, Asynchronous Transmission. Modulations and types-frequency, amplitude, phase Multiplexing and types -Frequency, time and wavelength, Switching techniques -Circuit, Message, Packet	10
4	Data link layer: Data link layer Design issues Error Detection & Correction- Types of Errors , Hamming Distance, Error Detection Parity Check, Cyclic Redundancy Check, Checksum Check Error correction Data Link Control - Framing, Flow & Error Control, Protocols-Simplex, Stop and Wait, Stop and Wait ARQ, Go Back N ARQ, Selective repeat ARQ. Multiple Access Protocol -ALOHA, CSMA, CSMA/CD, CSMA/CA Channelization, FDMA, TDMA, CDMA	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to:</i>
1	understand basics of networking concepts.
2	get knowledge of Network Hardware.
3	learn algorithms used to solve network problems.

Suggested Readings:

1. Computer Networking, Tannenbaum.
2. Data communication and networking, B A Forouzan, McGraw Hill

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III) (W.E.F. JUNE 2021)

Course Title: Ethics and Cyber Law (2141307)

Course Code: SEC-1

Total Hours 30

Course Credits 2

Marks:50

Course Objectives:

The basic objective of this course is to gain the knowledge about the cyber security, Cyber Laws, Ethical Hacking and various types of cyber-attacks.

Unit No	Content	Hrs.
1	Introduction to Cybercrime: what is Cybercrime, Categories of Cybercrime Classifications of Security attacks (Passive Attacks and Active Attacks), Essential Terminology (Threat, Vulnerability, Target of Evaluation, Attack, Exploit). Classifications of Cybercrimes: E-Mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Newsgroup Spam/Crimes from Usenet Newsgroup, Industrial Spying/Industrial Espionage, Hacking, Online Frauds, Pornographic Offenses, Software Piracy, Password Sniffing, Credit Card Frauds and Identity Theft. Cyber offenses: Scanning/Scrutinizing gathered Information, Attack (Gaining and Maintaining the System Access), Social Engineering, Cyber stalking, Cyber Cafe and Cybercrimes, Botnets: Attack Vector and Cloud Computing.	10
2	Cyber Law: Introduction, Information Technology Act-2000, Code of conduct for computer professionals, Weakness in Information Technology Act, Amendments to the Indian IT Act, Cybercrime and Punishment, key elements certification and monitoring prevention of crimes, contract aspect, security aspects, intellectual property aspects, Intellectual Property aspect, criminal aspect.	8
3	Introduction to Ethical Hacking: What is Hacking, Types of Hackers, Reasons for Hacking, Computer Ethics, Effects of Computer Hacking on an organization, Network Security Challenges ,Elements of Information Security, The Security, Functionality & Usability Triangle, What is Ethical Hacking, Scope & Limitations of Ethical Hacking, skills required, phases of ethical hacking, tools and techniques, Black Box, Gray Box and White Box techniques, What is Penetration Testing, What is Vulnerability Auditing, differences between vulnerability assessment.	10
4	Foot Printing: What is Foot printing, Objectives of Foot printing, finding a company's details, finding company's domain name, finding a company's address Internal URLs. Finding the details of domain registration, Finding the range of IP Address, Finding the DNS information, Finding the services running on the server, Finding the location of servers, Trace-route analysis, Tracking e-mail communications. Types of Attacks- phishing, keyloggers, backdoor access, password cracking, data stolen, data deleted virus attack.	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students should be able to:</i>
1	Students can explore, end acquire e critical understanding of Cyber Law.
2	Students can get depth knowledge of Information Technology Act.

Suggested Readings:

1. Cyber Security: Understanding Cyber
2. Crimes, Computer Forensics & Legal Perspectives, Naina Godbole, Sunita Belapure Wiley India Pvt. Ltd
3. Ethical Hacking and Countermeasures: Attack Phases EC-Council
4. The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws, Dafydd Stuttard Wiley
5. Gray Hat Hacking The Ethical Hackers Handbook, 3rd Edition Paperback, Allen Harper, Shon Harris, Jonathan Ness, Chris Eagle, McGraw Hill Education
6. CEH Certified Ethical Hacker Study Guide, By Kimberly Graves, Sybex Analysis and Design of Information Systems - James Senn - Prentice-Hall of India Pvt. Ltd

SYLLABUS FOR B..C. A SECOND YEAR (SEMESTER – IV) (W.E.F. JUNE 2021)**Course Title: Core Java (2141401)****Course Code: DSC-1D Theory-I****Total Hours 30****Course Credits 2****Marks:50****Course Objectives:**

The basic objective of this course is to develop desktop applications with the help of basic concepts like Object Oriented concepts, Exception handling, AWT and JDBC Connectivity.

Unit No	Content	Hrs.
1	Java Programming Fundamentals Overview of Java, JDK Environment and Tools, Data types, Variables, Operators, Keywords, Naming Conventions, Structure of Java Program Flow Control- Decision, Iterations, Arrays	8
2	Classes and Objects Class, Objects, Constructors, Use of this keyword, Static, non-static data members and methods, public, private & protected data members Inheritance & Polymorphism super, extends, single, multilevel, multiple inheritance, Method overriding, Method overloading, „final“ keyword, Extending interfaces	10
3	Event Programming Java awt components: window, Frame, Panel, Dialog, File Dialog, Label, Button, List, Check Box, Text Components, Choice, Menu Components Layout Managers-Border, Flow, Grid, Event Model, Listeners /Adapters	8
4	Exception Handling: Exceptions and Types, try. catch and finally block, throw & throws statement, user-defined exception. Java Data Base Connectivity (JDBC) Introduction to JDBC, Feature & Architecture of JDBC, Types of drivers, its advantage & disadvantage, JDBC Statements & Methods: statement, Prepared Statement, Callable Statement, execute (), executeQuery(), executeUpdate(), Working with ResultSet interface	10

Co No	Expected Course Outcomes
	<i>On completion of this course, the students should be able to:</i>
1	understand basics of java language.
2	learn Graphical User Interface design.
3	learn database connectivity with java used to develop Desktop Application.

Suggested Readings:

- 1.Programming with Java, 4th Edition ,E. Balaguruswamy ,McGraw Hill
- 2.Core Java 2 Volume 1, 9th Edition,Cay S. Horstmann, Gary Cornell ,Printice Hall.
- 3.The Complete Reference Java,Herbert Schildt,McGraw Hill

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – IV)(W.E.F. JUNE 2021)**Course Title: Data Structures using C-II ((2141402))****Course Code: DSC-1D Theory-II Total Hours 30 Course Credits 2 Marks:50****Course Objectives:**

The objective of this course is to provide the necessary knowledge to design and data in various ways, implementation of searching data in faster way.

Unit No	Content	Hrs.
1	Sorting: Introduction, definition of sorting, Types of sorting-Bubble sort, selection sort, Insertion sort, Shell sort, Radix sort, Implementation of all sorting techniques.	10
2	Searching- Introduction and definition of searching, Types of searching- Linear search, Binary search, Indexed sequential search, different hash functions.	8
3	Trees- Introduction to tree, and definition of tree, Introduction to binary tree, operations of binary tree, Representation of binary tree, Types of binary tree- Strictly binary tree, Complete binary tree, Extended binary tree, Tree traversal methods, Implementation of BST.	10
4	Graph: Concept of terminologies used in graph, graph representation using array and linked list, Graph traversals- BFS and DFS and application of graph.	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students should be able to:</i>
1	Students will get knowledge of Sorting and Searching methods in data structure
2	Student can understand different operations of tree and graph.

Suggested Readings:

- 1.SQL, PL/SQL The programming language of Oracle ,Ivan Bayross ,BPB
- 2.MySQL(TM): The Complete Reference,Vikram Vaswani,McGraw-Hill
- 3.Learning MySQL ,Seyed Tahaghoghi,Hugh Williams.
- 4.MYSQL 5 for professional,Ivan Bayross and Sharanam Shah,X-team

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – IV)(W.E.F. JUNE 2021)

Course Title: MySQL(2141403)

Course Code: DSC-2D Theory-I Total Hours 30 Course Credits 2 Marks:50

Course Objectives: Main objectives of this course is to get knowledge about MySql operations, functions, stored procedures & transactions

Unit No	Content	Hrs.
1	Introduction to MYSQL Installing and starting MySQL instance, History and Architecture of MySQL, Components of MySQL -DDL, DML,DQL,DCL Data types in MySQL-Numeric, String, Complex, Date and Time, creating databases and show databases	8
2	Performing Operation on Table Data Populating tables with data, Retrieving data from tables, Sorting data in a table, Deleting data from table, Updating data in tables, searching data Adding and Dropping columns, Modifying and Rename existing columns Renaming table using alter table, Changing a table type Finding out the tables created by user, Displaying a table structure Creating a table from a table, Inserting data into a table from another table MySQL Operators, Function and clauses MySQL operators- Arithmetic, Comparison, Logical, Bit, like MySQL Functions Aggregate, Math, String, Date and Time, control flow functions and expressions, Type conversion, Formatting, Encryption MySQL clause-where, distinct, order by, group by, having, rollup	10
3	MySQL constraints, Join and View Applying data constraints- column level and table level Types of Data constraints- I/O constraints- Not null, Unique, Primary key, Foreign key,composite Business rule constraints- Check, Adding, Modify and drop constraints using alter table command MySQL join:- Advantages & disadvantages of Join, Types of Joins MySQL View:- why view, Create, Update, Alter and Drop view SubQueries, Union and Indexing sub queries-use, example Set Operations- Union, Union all, Minus and Intersect Indexing:- Advantages and disadvantages of Indexing, creating index (simple, composite, unique),multiple indexing, drop index	10
4	Stored Procedures, Transaction and cursor Stored Procedure:- Structure, use of stored procedure, Supported SQL statements in Procedures, creating dynamic procedure, Adding record to the table using procedure, procedure with IN,OUT,INOUT parameter, dropping procedure. Transaction :MySQL transactions, open and closing transaction, commit, rollback, savepoint in transaction, table lock Cursor:-use of cursor, types of cursor ,opening a cursor, fetching a record from the cursor, cursor fetch statement, closing cursor MySQL import & export- Import CSV File into MySQL Table, Export MySQL Table to CSV	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to:</i>
1	learn structured query language.
2	learn how to design and implement backend for project development.
3	learn PL /SQL.

Suggested Readings:

1. SQL, PL/SQL The programming language of Oracle, Ivan Bayross BPB
2. MySQL(TM): The Complete Reference, Vikram Vaswani, McGraw-Hill
3. Learning MySQL, Seyed Tahaghoghi, Hugh Williams.
4. MYSQL 5 for professional, Ivan Bayross and Sharanam Shah, X-team

Course Title: XML Programming (2141404)

Course Code: DSC-2D Theory-II Total Hours 30 Course Credits 2 Marks:50

Course Objectives:

The main objective of the course is to provide knowledge about XML basics various xml concept to organize data on web applications.

Unit No	Content	Hrs.
1	Introduction Understanding Mark-up Languages, Introduction to XML and its Goals, Basic XML tools , How to use XML , Advantages of XML	10
2	XML Basics XML Structure, XML Syntax, XML Comment, XML Tags, Xml tree, XML Elements, XML Validation, XML Attributes, XML Elements vs. Attributes, XML in HTML XML DTD – introduction, DTD elements, DTD attributes, DTD Entities, Anatomy of a DTD ,DTD Limitations	8
3	Other XML Concepts Scripting XML, XML as Data, Linking with XML. XML with Style: XSL –Style Sheet Basics, XSL basics, XSL style sheets, xml application, XML Http Request	10
4	Extensible Style sheet Language Transformations Introduction, XSLT Languages, XSLT Transform, XSLT <template> ,XSLT <value of>,XSLT <for-each>, XSLT <sort>,XSLT <if>,XSLT <choose> ,XSLT Apply ,XSLT on the Client, XSLT on the Server, XSLT Edit XML,XSLT Examples, Introduction to JSON as alternative to XML.	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to learn:</i>
1	The basics of creating XML documents, Transforming XML documents and validating XML Document
2	To develop a valid XML document based on a DTD
3	to use XML for data transfer.

Suggested Readings:

- 1.XML: Extensible Markup Language (Simplified) Feyisayo Dosunmu, Omolabake
- 2.XML: The Complete Reference,Heather Williamson,McGraw Hill ,Education

SYLLABUS FOR B.C.A SECOND YEAR (SEMESTER – III)(W.E.F. JUNE 2021)

Course Title: Angular JS (2141405)

Course Code: DSC-3D Theory-I Total Hours 30 Course Credits 2 Marks:50

Course Objectives: The main objective of this course is to design the single web page using various angular modules, directives and filters.

Unit No	Content	Hrs.
1	Overview of AngularJS: What is AngularJS?, Why AngularJS?, Features of AngularJS, AngularJS architecture, Setting up the Environment, Model- View-Controller explained, My first AngularJS app Directives: Introduction to Directives, Directive lifecycle, Using AngularJS built-in directives, Core Directives, Conditional Directives, Style Directives, Mouse and Keyboard Events Directives, Matching directives, Creating a custom directive Angular Expressions: All about Angular expressions, How to use expressions, Number and String Expressions, Object Binding and Expressions, Working with Arrays, Forgiving Behavior, Angular expressions v/s Javascript Expressions	10
2	Controller: Role of a Controller, Attaching properties and functions to scope, Nested Controllers, Using filters in Controllers, Controllers in External Files, Controllers & Modules, Controllers Filters: Built-in filters, Uppercase and Lowercase Filters, Currency and Number Formatting Filters, OrderBy Filter, Filter Filter, Using AngularJS filters, Creating custom filters AngularJS Modules: Introduction to AngularJS Modules, Module Loading and Dependencies, Creation vs Retrieval, Bootstrapping AngularJS	8
3	AngularJS Forms: Working with Angular Forms, Model binding, Understanding Data Binding, Binding controls to data, Form controller, Validating Angular Forms, Form events, \$error object, Scope-What is scope, Scope lifecycle, Two way data binding, Scope inheritance, Scope & controllers, Scope & directives, \$apply and \$watch, Rootscope, Scope broadcasting, Scope events	8
4	Single Page Application(SPA): What is SPA, Pros & Cons of SPA, Installing the ngRoute module, Configure routes, Passing parameters, Changing location, Resolving promises, Create a Single Page Application, AngularJS Animation: ngAnimate Module, CSS transforms, CSS transitions, Applying animations, Directives supporting animation`	10

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to:</i>
1	Develop Single Page Application.
2	Include responsive animations in webpage.

Suggested Readings:

1. Professional AngularJS, Diego Netto and Valeri Karpov, Wrox press
2. Learning AngularJS, Brad Dayley, Pearson
3. AngularJS, Brad Green and Shyam Seshadri O'Reilly
4. AngularJS Up & Running, Shyam Seshadri & Brad Green

Course Title: Advanced Computer Networks (2141406)

Course Code: DSC-3D Theory-II Total Hours 30 Course Credits 2 Marks:50

Course Objectives: The main objective of this course is to get knowledge about the implementation of various layers in the network functions of network layers and network security.

Unit No	Content	Hrs.
1	Network layer: Network layer Design issues. Routing Algorithm: Optimality Principle, Shortest Path Routing, Distance Vector Routing, Link State Routing, Broadcast Routing, Multicast Routing Congestion Control Algorithm: General principle of congestion control, Congestion prevention policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets.	8
2	Transport, Session, Presentation & Application layers: Elements of Transport Protocols-Addressing, Connection establishment, Connection Release, Flow Control & Buffering. TCP/IP protocol suite: Transmission Control Protocol, User Datagram Protocol, IP, Real Time Transport Protocol, FTP, DNS, TelNet, SMTP, POP, HTTP, WWW, SNMP, ARP, RARP etc., Data Compression: Audio Compression, Video Compression.	8
3	Network and Web Security: Introduction Network security, Security Techniques- Encryption & decryption, Digital Signatures, Cryptography, Firewall Security Services. Authentication Mechanisms: Passwords, Smart, Card, Biometrics. Web Security: SSL Encryption, TLS, SET, Email Security, PGP / MIME, IP Security.	10
4	Network Services: VPN, Virtual LAN, Wi-Fi Network, Remote Sensing, GPS GPRS, GSM, Video Conferencing. CASE study-Linux: Installing client & server, Roles & responsibility of Network Administrator, Server Management Login Script Network Servers: Ftp Server, News & search server, Web Server, Samba Server, Mail Server, Proxy Server, Print Server, User & group management.	10

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to:</i>
1	understand Congestion mechanism and how data will be routed in a network.
2	get knowledge of Wireless technologies.
3	understand importance of network security.

Suggested Readings:

- 1.Computer Networking,Tannenbaum.
- 2.Data communication and networking,B A Forouzan,McGraw Hill

Course Title: Python Programming (2141407)

Course Code: SEC-2 Total Hours 30 Course Credits 2 Marks:50

Course Objectives: The main objective of this course get knowledge about the basics of python programming, to design python GUI applications.

Unit No	Content	Hrs.
1	Introduction to Python: Features/Characteristics of Python, Structure of a Python Program, Writing simple python program, Executing python program using command line window and IDLE graphics window, Python Virtual Machine, Identifiers and Keywords, Python Variables, Data types, Sequences, Sets, Literals, Constants, Type conversion, I/O Statements, Command line Arguments, Operators: Arithmetic, Relational, Logical, Boolean, Assignment, Bit wise, Membership, Identity, Operator Precedence and Associativity Conditional Statements: if, if-else, nested if –else, Looping-for, while, nested loops, Loop manipulation using pass, continue, break, assert and else suite	8
2	Array: introduction, importing and slicing on array, types of array, compare and aliasing. Strings: Introduction to String, String Manipulation. Collection List: Introduction to List, Manipulating list,tuples, Dictionaries: Concept of Dictionary, Techniques to create, update & delete dictionary items. Functions: Defining a function, Calling a function, Advantages of functions, Types of functions, Global and Local variables, Modules: Importing module, Creating & exploring modules, Math module, Random module, Time Module Object Oriented Programming: Features, Concept of Class & Objects, Constructor, Types of Variables, Namespaces, Types of Methods, Inner Classes, Constructors in Inheritance, Overriding Super Class Constructors and Methods, Types of Inheritance, Abstract Classes and Interfaces, The Super() Method, Operator Overloading, Method Overloading, Method Overriding. Threads: Introduction, uses, types, creating threads, thread class methods and synchronization	10
3	Regular Expressions: Introduction to Regular Expression, Advantages &Operations, Sequence characters in Regular Expression, Powerful pattern matching and searching, Password, email, url validation using regular expression, Pattern finding programs using regular expression Exception Handling: Errors in a Program, Exceptions, Exception handling, Types of Exceptions, User-defined Exceptions Python File Operation: Types of File, Opening and Closing a File, Reading and writing to files, .csv file operations, Manipulating directories.	10
4	Graphical user interface: root window, fonts and colors, working with containers, canvas, frame, widgets and its types, Label, Button, Checkbutton, Entry, Listbox, Message, Radiobutton, Text, Spinbox etc. Database connectivity: Installing MySQLdb module, working with MySQL, Retrieving, inserting, Deleting and Updating rows into table, creating database tables	8

Co No	Expected Course Outcomes
	<i>On completion of this course, the students will be able to learn :</i>
1	Graphical User Interface design in Python.
2	Database Connectivity with Python for Desktop Application Development.
3	use and implementation of multithreading and synchronization.

Suggested Readings:

- 1.Core Python Programming,Dr.R.Nageshwara Rao, DreamTech
- 2.Beginning Python,Magnus Lie Hetland, Apress

List of Experiments

DSC-1C & 1D Practical-II & III (2141408)	
Experiment No.	Title
1	Write different programs in „C++“ language that shows use of array, pointer variable, reference variable, cin and cout objects, scope resolution operators, and basic operators.
2	Write a program to implement class and object in C++.
3	Write a program that shows different parameter passing techniques in C++
4	Write a program that shows defining member function inside and outside of class body
5	Write a program to implement default, parameterized and copy constructor
6	Write a program to implement constructor overloading.
7	Write a program to implement inline function.
8	Write a program to implement constructor and destructor.
9.	Write a program to implement static data member and static member function.
10.	Write a program to implement Nested Class.
11.	Write a program to implement passing and returning object through function.
12.	Write a program for addition, subtraction, multiplication and division of two complex numbers by using return by object method.
13.	Create 2 distance classes “class A” stores distance in meter and cm and “Class B” stores distance in feet and inches and add two distances by friend function and display the result.
14.	Generate the result for 5 students with following data - Name, exam no, Theory marks in 5 subjects, grade. Use array of object concept.
15.	Write a program to calculate root of quadratic equation by using default argument constructor.
16.	Write a program to demonstrate friend function, friend class, member function of a class is friend to another class.
17.	Write a program to overload unary operators (++,-).
18.	Write a program to implement single inheritance (private, public)
19.	Write a program to implement multi-level inheritance
20.	Write a program to implement multiple inheritance

21	Write a program to implement multi-path inheritance
22	Write a program that shows use of virtual function.
23	Write a program that shows use of abstract class
24	Write a program that shows use of virtual destructor
25	Write a program that shows use of different manipulators.
26	Write a program to read, write and append data into file.
27	Write a program that shows use of random access of file.
28	Write a program to merge contents of two files into third file.
29	WAP to demonstrate the use of various data types in java.
30	WAP to print following pattern in java. a. A b. A B c. A B C d. A B C D
31	WAP to accept which will check number for Armstrong, prime, palindrome & perfect number in java.
32	WAP using arrays to sort player name along with timing of Athlete (sort using two dimensional array) using java.
33	WAP to demonstrate the use of Access Control.(public, private , protected).
34	WAP using static & non-static data members of a java class.
35	WAP using Interface in java.
36	WAP to demonstrate use of Exception Handling in java.
37	WAP which will create user defined Exception in java.

38	WAP which will accept string and calculate how many vowels present in it in java.
39	WAP which will accept range of years from users and print leap years between them in java.
40	WAP to reverse the number in java.
41	WAP which will accept number and displays it in words. e.g.- If number-123 as one two three.(use switch in java).
42	WAP which will demonstrate overloading & Inheritance in java.

43	WAP to display the following pattern in java. *1 **2 ***3
44	WAP to implement default and parameterized constructor in java.
45	Create Frame using awt which contains one combo box for font name, one list box , for font size and three radio button for font style i.e. Bold, Italic and Normal ,apply these effects on text present in text field
46	WAP which will insert student records into database having fields roll no, name, marks of five subjects, total marks and percentage and display the same.
47	WAP to implement Various JDBC statements in java
48	WAP to demonstrate use of ResultSet interface in java.
49	Write a program to implement stack by using array. (Static Implementation of stack)
50	Write a program, which reverses the string by using stack.
51	Write a program to check entered string is palindrome or not by using stack.
52	Write a program to convert decimal number into binary number by using stack.
53	Write a program to count total number of vowels present in string by using stack

54	Write a program which check entered expression is valid or not.
55	Write a program to calculate factorial of entered number by using recursion.
56	Write a program to calculate digit sum of entered number by using recursion.
57	Write a program to find face value of entered number by using recursion.
58	Write a program to implement linear queue by using array. (Static Implementation of queue)
59	Write a program to implement Circular queue.
60	Write a program to implement Priority queue.
61	Write a program to implement singly linear linked list with its basic operations.
62	Write a program to implement stack by using linked list. (Dynamic implementation)
63	Write a program to implement queue by using linked list. (Dynamic implementation)

64	Write a program to implement doubly linear linked list with its basic operation.
65	Write a program to implement binary search tree with tree traversal methods.
66	Write a program to implement BST with following operations: I) Insert Node II) Count Leaf nodes III) Count Non-Leaf nodes IV) Count Total nodes
67	Write a program to implement BST with following operations: I) Insert Node II) Find Maximum node III) Find Minimum Node IV) Search node V) Display only odd nodes VI) Display only even nodes VII) Display leaf nodes VIII) Find level of node IX) Find degree of node X) Delete Node
68	Write a program to represent undirected and directed graph by using Adjacency matrix.
69	Write a program to represent weighted graph by using Adjacency matrix.
70	Write a program to implement graph by using linked list and perform following operations:

	<ol style="list-style-type: none"> 1. Insert Vertex (Node) 2. Display Vertices 3. Search Vertex 4. Insert Edge 5. Find adjacent Vertices 6. Display Graph
71	Write a program to implement breadth first search (BFS) traversal of graph.
72	Write a program to implement depth first search (DFS) traversal of graph.
73	Write a program to implement simple exchange sort method.
74	Write a program to implement bubble sort method.
75	Write a program to implement insertion sort method.
76	Write a program to implement selection sort method.
77	Write a program to implement Shell sort method.
78	Write a program to implement Linear searching technique.
79	Write a program to implement Binary search technique.

Experiment No.	Title																																																												
1	Draw a sample ER Diagram for two entities Student and College and their relationship .Student entity has attributes such as Stu_Id, Stu_Name & Stu_Addr and College entity has attributes such as Col_ID & Col_Name.																																																												
2	Draw a ER Diagram for Library Management System.																																																												
3	Draw an ER Diagram for Student admission process .																																																												
4	Draw a ER Diagram for Hospital Management System.																																																												
5	Draw an ER Diagram for Inventory Management System.																																																												
6	<p>Player relation</p> <table border="1"> <thead> <tr> <th>Player Id</th> <th>Team Id</th> <th>Country</th> <th>Age</th> <th>Runs</th> <th>Wickets</th> </tr> </thead> <tbody> <tr> <td>1001</td> <td>101</td> <td>India</td> <td>25</td> <td>10000</td> <td>300</td> </tr> <tr> <td>1004</td> <td>101</td> <td>India</td> <td>28</td> <td>20000</td> <td>200</td> </tr> <tr> <td>1006</td> <td>101</td> <td>India</td> <td>22</td> <td>15000</td> <td>150</td> </tr> <tr> <td>1005</td> <td>101</td> <td>India</td> <td>21</td> <td>12000</td> <td>400</td> </tr> <tr> <td>1008</td> <td>101</td> <td>India</td> <td>22</td> <td>15000</td> <td>150</td> </tr> <tr> <td>1009</td> <td>103</td> <td>England</td> <td>24</td> <td>6000</td> <td>90</td> </tr> <tr> <td>1010</td> <td>104</td> <td>Australia</td> <td>35</td> <td>1300</td> <td>0</td> </tr> <tr> <td>1011</td> <td>104</td> <td>Australia</td> <td>29</td> <td>3530</td> <td>10</td> </tr> <tr> <td>1012</td> <td>105</td> <td>Germany</td> <td>28</td> <td>1421</td> <td>166</td> </tr> </tbody> </table>	Player Id	Team Id	Country	Age	Runs	Wickets	1001	101	India	25	10000	300	1004	101	India	28	20000	200	1006	101	India	22	15000	150	1005	101	India	21	12000	400	1008	101	India	22	15000	150	1009	103	England	24	6000	90	1010	104	Australia	35	1300	0	1011	104	Australia	29	3530	10	1012	105	Germany	28	1421	166
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1014 105 Germany 21 3599 205

Deposit relation

Acc. No.	Cust name
A 231	Rahul
A 432	Omkar
R 321	Sachin
S 231	Raj
T 239	Sumit

Borrower relation

Loan No.	Cust-name
P-3261	Sachin
Q-6934	Raj
S-4321	Ramesh
T-6281	Anil

Consider above tables and Solve following examples using selection

- operation:** a. Find all tuples from the player relation for which country is India.
- b. Select all the tuples for which runs are greater than or equal to 15000.
- c. Select all the players whose runs are greater than or equal to 6000 and age is less than 25

7

Consider above tables and Solve following examples using project

- operation:** a. List all the countries in Player relation.
- b. List all the team ids and countries in Player Relation

8

Consider above tables and Solve following examples using set difference

- operation:** a. Find all the customers having an account but not the loan.
- b. Find all the customers having a loan but not the account.

SNUM 2001 Harsh Baroda 100

1001 2002 Gita Pune 200 1003

2003 Lalit Mumbai 200 1002 2004

Govind Delhi 300 1002 2006

Chirag Surat 100 1001 2008

Prajakta Delhi 300 1007

2007 Sushma Mumbai 100 1004

Salesmen

SNUM SNAME CITY COMMISSION

1001 Prashnat Mumbai 12

1002 Rajesh Surat 13

1004 Anandi Mumbai 11

1007 Priya Delhi 15

1003 Suchita Pune 10

1005 Nayan Baroda 14

Orders

ONUM	AMOUNT	ODATE	CNUM	SNUM
3001	18	10/3/2019	2008	1007
3003	767	15/3/2019	2001	1001
3002	1900	10/3/2019	2007	1004
3005	5160	20/4/2019	2003	1002
3006	1098	20/4/2019	2008	1007
3007	1713	10/5/2019	2002	1003
3008	75	10/5/2019	2004	1002

Create the following Databases.

Customers

CNUM CNAME CITY RATING

	<p>3010 4723 15/6/2019 2006 1001</p> <p>3011 1309 18/3/2019 2004 1002</p>
10	<p>Solve the following queries using above databases. Use where clause range searching and pattern matching.</p> <ol style="list-style-type: none"> 1. Produce the order no, amount and date of all orders. 2. Give all the information about all the customers with salesman number 1001. 3. Display the following information in the order of city, sname, snumand commission. 4. List of rating followed by the name of each customer in Surat. 5. List of snum of all salesmen with orders in order table without any duplicates.
11	<p>Solve the following queries using above databases and group by clause.</p> <ol style="list-style-type: none"> 1. Find out the largest orders of salesman 1002 and 1007. 2. Count all orders of October 3, 1997. 3. Calculate the total amount ordered. 4. Calculate the average amount ordered. 5. Count the no. of salesmen currently having orders.
12	<p>Solve the following queries using above databases and formatted output and order by clause.</p> <ol style="list-style-type: none"> 1. List all salesmen with their % of commission. 2. Display the no. of orders for each day in the descending order based on no. of orders. 3. Display order number, salesman no and the amount of commission for that order. 4. Find the highest rating in each city in the form: For the city (city), the highest rating is (rating) 5. List all in descending order of rating. 6. Calculate the total of orders for each day and place the result in descending order.

13	<p>Solve the following queries using above databases and join.</p> <ol style="list-style-type: none"> 1. Show the name of all customers with their salesman's name. 2. List all customers and salesmen who shared a same city. 3. List all orders with the names of their customer and salesman. 4. List all orders by the customers not located in the same city as their salesman. 5. List all customers serviced by salespeople with commission above 12%.
14	<p>Solve the following queries using above databases and join and subquery.</p> <ol style="list-style-type: none"> 1. Find all orders attributed to salesmen in 'London'. 2. List the commission of all salesmen serving customers in 'London'. 3. Find all customers whose cnum is 1000 above than the snum of „Sejal“. 4. Count the no. of customers with the rating above than the average of 'Surat'. 5. List all orders of the customer 'Chirag'.
15	<p>Solve the following queries using above databases and delete and update.</p> <ol style="list-style-type: none"> 1. Remove all orders from customer Chirag from the orders table. 2. set the ratings of all the customers of Piyush to 400. 3. Increase the rating of all customers in Rome by 100. 4. Salesman Sejal has left the company. Assign her customers to Miti. 5. Salesman Miti has resigned. Reassign her number to a new salesman Gopal whose city is Bombay and commission is 10%.
16	<p>Solve the following queries using above databases and alter table and table constraints..</p> <ol style="list-style-type: none"> 1. How the onum field is forced to be an unquie? 2. Create an index to permit each salesman to find out his orders by date quickly. 3. Write a command to enforce that each salesman is to have only one customer of a given rating. 4. Write a command to add the item-name column to the order table. 5. Write a command to create the salesmen table so that the default commission is 10% with no NULLs permitted, snum is the primary key and all names contain alphabetical only. 6. Give the commands to create our sample tables (salesmen, customer,orders) with all the necessary constraints like primary key, not null, unique, foreign key.

17	<p>Solve the following queries using above databases and view.</p> <p>1. Create a view called big orders which stores all orders larger than Rs. 4000. 2. Create a view Rate count that gives the count of no. of customers a teach rating. 3. Create a view that shows all the customers who have the highest ratings. 4. Create a view that shows all the number of salesmen in each city. 5. Create a view that shows the average and total orders for each salesmen after his name and number.</p> <p>6. Create a cursor emp cur,fetch record from emp table and check whether sal>10000 then update Grade = „A“ else if sal = > 5000 and sal<= 10000 then update Grade = „B“ 7. Write a procedure to find the table structure of a given number</p> <p>8. Write a procedure on software table to calculate selling cost of all software of a specified person</p>
18	Design test case for Gmail Login Functionality in software testing and Quality assurance
19	Design test case for college admission Application in software testing and Quality assurance
20	Design test case for online order processing in software testing and Quality assurance
21	Design test case for MS-word application in software testing and Quality assurance
22	Design test case for simple calculator in software testing and Quality assurance
23	Design test case for ball pen in software testing and Quality assurance
24	Design test case for Paint application in software testing and Quality assurance
25	Design test case for Online Flight Booking in software testing and Quality assurance
26	WAP to display book details in XML using tree structure.
27	WAP to demonstrate attributes in XML .
28	WAP to demonstrate empty element in XML.
29	WAP to demonstrate XML Naming Styles.
30	WAP to demonstrate XML namespace.

31	WAP to implement XML default namespace.
32	WAP to implement breakfast menu program in XML
33	WAP to demonstrate use of XMLHttpRequest Object.
34	WAP to demonstrate Internal DTD in XML.
35	WAP to demonstrate XML style sheet .
36	WAP to demonstrate XSLT
37	WAP to demonstrate JSON as alternative to XML.

DSC-3C & 3D Practical -II & III(2141410)

Experiment No.	Title
1	Write PHP code to check entered number is Armstrong or Not.
2	Write a menu driven program using hyperlink to perform following operations: a) Check Number is Palindrome or not. b) Check Number is Perfect or not. c) Find face value of Entered number. d) Check Number is Prime or not. e) Check Number is Strong or not
3	Write a PHP code to perform following operations: a) Sort array element b) Find Maximum and Minimum number in array c) Merge two arrays in third array. d) Swap two array elements
4	Write a program to overload the constructor.
5	Write a program which uses the static methods and static variables.
6	Write a program to implement different types of inheritance.
7	Write a program to implement interface.
8	Write a program to handle different types of exceptions.
9	Write a program which shows the use of „final“ keyword.
10	Design a web application to perform following task on employee table. I) Add New II) Save III) Delete IV) Update V) Move First VI) Move Last
11	Design a web application that uses cookies and session object.
12	Write an angular js program which displays your name, college name and age.

13	Write an angular js program which demonstrate one way data binding and two way data binding.
14	Write an angular js program which demonstrates ng-cut, ng-copy, ng-paste directive.
15	Write an angular js program which demonstrates different directive related to keyboard.
16	Write an angular js program which demonstrate conditional directive.
17	Write an angular js program for creating custom directive which display employee id and name.

18	Write an angular js program which demonstrate all types of expressions 1) Number expression 2) String expression 3) Object expression 4) Array expression
19	WAP to demonstrate nested controller.
20	WAP to demonstrate multiple controller.
21	WAP to demonstrate json filter.
22	WAP to demonstrate custom filter
23	WAP to design simple single page application.
24	WAP to implement custom validation in angular js.

SEC-2 Practical-II	
Experiment No.	Title
1	1) Installing Python and setting up Python environment.
2	Write a program to print strings, numbers and perform simple mathematical calculations.
3	Write a program to implement command line arguments.
4	Write a program to implements conditional statements -if, if-else, nested if.
5	Write a program to implement loops.

6	Write a program to manipulate strings like string copy, string concatenation, string comparison, string length, string reverse etc.
7	Write program to implement List and Tuple.
8	Write program to implement dictionary.
9	Write program to implement Functions & Modules
10	Write program to implement Package.
11	Write a program to implement Constructors.
12	Write a program to implement types of Inheritance and Interfaces.
13	Write a program to implement Method Overloading and Method Overriding.
14	Write a program to implement Operator Overloading.
15	Write a program in to read and write contents in a file.
16	Write a program to demonstrate Exception handling.
17	Write a program to demonstrate user defined exception.
18	Write a program to demonstrate the use of regular expressions.
19	Write a program to draw different shapes.

**Chairman
BOS in BCA**

Academic Council 3(3.3)
10th August, 2021

**All UG Fourth Semester Compulsory
Course Environmental Studies (CBCS
- Syllabus) - 2021**

- 1) **Title of the Paper:** Environmental Studies
- 2) **Total Hours:** 60 hours

**Structure for
Environmental Studies**

	Name and type of the paper	L/P	Credits	Total	SEE	CA*
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	Type	Name			Marks		
Class& code	For All UG Semester IV (Second year)						
All UG II Year (4th Semester) (EVS)	Ability Enhancement Course (AECC)	Environmental Studies	60	04	50	35	15

Compulsory: *Unit Test / Assignment/ Seminar/ Nature Visits / Field Work / Field Tour/ Industrial visits of 1-2 days and submission of report is compulsory under internals marks (CA)

1. This course is not considered as a passing head for counting passing heads for ATKT
2. Student must pass this subject for award of the degree

Evaluation Scheme:

Theory paper has 50 marks out of which 35 marks will be for Term End examination (SEE) and 15 marks for College Internal Assessment (CA). The candidate has to appear for internal evaluation of 15 marks and external evaluation (College Examination) of 35 marks.

A) College Internal Evaluation:

In case of theory paper, internal examination has to conduct by College Marks for internal assessment shall be given based on Unit Test / Assignment/ Seminar/ Nature Visits / Field Work

/ Field Tour/ Industrial visits of 1-2 days and submission of report is compulsory under internals marks (CA)

B) External Evaluation (End of Term College Examination):

Nature of Theory question paper:

- 1) Theory paper is of 35 marks.
- 2) Theory paper will be of 2 hours duration
- 3) Students have to attempt all the questions.

Structure of the Course

CBCS BA PART II SEMESTER - IV AECC – EVS

Paper: Environmental Studies (2100433)

(Theory 35 + Internal 15 = 50

Marks)

COURSE CREDIT:- 3L + 1T/H=4

COURSE CONTACT HOUR :- 50 L+ 10T/H=60

Sr. No.	Module	Module contact hours
1	Introduction to environmental studies	04
2	Ecosystems	06
3	Natural Resources: Renewable and Non-renewable Resources	08
4	Biodiversity and Conservation	08
5	Environmental Pollution	08
6	Environmental Policies & Practices	08
7	Human Communities and the Environment	08
8	Field work	10
	Total	60

Environmental Studies (AECC) (2100433)

Learning Objectives:

To acquaint students with the concept of environmental studies

To compare the relation between human and environment

To analyze the resources and biodiversities

To aware with environmental issues and policies

Outcomes:

Explain the basic concepts in Environmental Studies

Categorize Ecosystems in different regions

Examine Natural Resources and Associated Problems

Motivate people for the conservation of environment

Justify the need of sustainable development,

Field study to a local area to document environmental assets

Module 1: Introduction to environmental studies 04

- 1.1 Multidisciplinary nature of environmental studies
- 1.2 Scope and importance of environmental studies
- 1.3 Concept of sustainability and sustainable development

Module 2: Ecosystems

06

- 2.1 Concept, Structure and function of ecosystem
- 2.2 Energy flow in an ecosystem: food chains, food webs and ecological succession.
- 2.3 Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Module 3: Natural Resources: Renewable and Non-renewable Resources

08

- 3.1 Land resources and land use change; Land degradation, soil erosion and desertification.
- 3.2 Deforestation: Causes and impacts due to mining, dam building on environment, forests,

biodiversity and Tribal populations.

3.3 Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water International & inter-state.

3.4 Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing Energy needs, case studies

Module 4: Biodiversity and Conservation

08

4.1 Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots

4.2 India as a mega-biodiversity nation; Endangered and endemic species of India

4.3 Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;

4.4 Conservation of biodiversity: In-situ and Ex--situ conservation of biodiversity.

4.5 Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Module 5: Environmental Pollution

08

5.1 Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution Nuclear hazards and human health risks

5.2 Solid waste management: Control measures of urban and industrial waste.

5.3 Pollution case studies.

Module 6: Environmental Policies & Practices

08

6.1 Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture

6.2 Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

6.3 Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Module 7: Human Communities and the Environment

08

7.1 Human population growth: Impacts on environment, human health and welfare.

7.2 Resettlement and rehabilitation of project affected persons; case studies.

7.3 Disaster management: floods, earthquake, cyclones and landslides.

7.4 Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.

7.5 Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

7.6 Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Module 8: Field work

10

Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.

Visit to a local polluted site: Urban/Rural/Industrial/Agricultural.

Study of common plants, insects, birds and basic principles of identification. Study of simple ecosystems: pond, river, Delhi Ridge, etc.

Suggested Readings:

1. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. *Global Ethics and Environment*, London, Routledge.
4. Gleick, P.H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, and Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. *Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339:36---37.
7. McCully, P. 1996. *Rivers no more: the environmental effects of dams* (pp.29---64). Zed Books.
8. McNeill, John R. 2000. *Something New Under the Sun: An Environmental History of the Twentieth Century*.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. *Fundamentals of Ecology*. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. *Environmental and Pollution Science*. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. *Environment*. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M.L. 2001. *Environmental law and policy in India*. Tripathi 1992.
14. Sengupta, R. 2003. *Ecology and economics: An approach to sustainable development*. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds.) 2013. *Conservation Biology: Voices from the Tropics*. John Wiley & Sons.
17. Thapar, V. 1998. *Land of the Tiger: A Natural History of the Indian Subcontinent*.
18. Warren, C.E. 1971. *Biology and Water Pollution Control*. W.B. Saunders.
19. Wilson, E.O. 2006. *The Creation: An appeal to save life on earth*. New York: Norton.
20. World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University Press.
21. पर्यावरण अभ्यस, डॉ एन बी तेली, डॉ. एन. एन. चक्रदेव इत्र्यदी
22. पर्यावरण अभ्यस, डॉ बलभीम चव्हाय

Chairman
BOS Environment Studies

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