

MANGALORE UNIVERSITY



State Education Policy – 2024 [SEP-2024]

CURRICULUM STRUCTURE

FOR

BSC-COMPUTER SCIENCE

III and IV Semester

MANGALORE UNIVERSITY

Suggested programme structure for the Under Graduate Programmes

Bachelor of Science-B.Sc.

Semester	Course 1	Course 2	Course 3	Elective / Optional	Language	Compulsory	Total Credit	Total Working hours
I	5 (3T+2P)	5 (3T+2P)	5 (3T+2P)		3+3	2	23	4+4+4+4+4+4+4+4+2=34
II	5 (3T+2P)	5 (3T+2P)	5 (3T+2P)		3+3	2	23	4+4+4+4+4+4+4+4+2=34
III	5 (3T+2P)	5 (3T+2P)	5 (3T+2P)	2	3+3		23	4+4+4+4+4+4+4+4+2=34
IV	5 (3T+2P)	5 (3T+2P)	5 (3T+2P)	2	3+3	2	25	4+4+4+4+4+4+4+4+2+2=36
V	8[(2x3T)+2P]	8[(2x3T)+2P]	8[(2x3T)+2P]			2	26	3+3+4+3+3+4+3+3+4+2=32
VI	8[(2x3T)+2P]	8[(2x3T)+2P]	8[(2x3T)+2P]			2	26	3+3+4+3+3+4+3+3+4+2=32
							146	202

Note:

- **Course1, Course2 and Course3: I to IV Semester: Theory 3 credits = 4 contact hours & Practical 2 credit = 4 contact hours**
- **Course1, Course2 and Course3: V and VI Semester: 3 credits = 3 contact hours & Practical 2 credit = 4 contact hours**
- **Elective/Optional: 2 credits = 2 contact hours**
- **Languages: 3 credits = 4 contact hours**
- **Compulsory: 2 credits = 2 contact hours**

CURRICULUM STRUCTURE FOR I TO VI SEMETER BSC-COMPUTER SCIENCE

Semester I								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BSCCSCS101	Computer Fundamentals and Programming in C	Core	4	80	20	100	3
2	BSCCSPS101	C Programming-Lab	Practical	4	40	10	50	2

Semester II								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BSCCSCS201	Data Structures	Core	4	80	20	100	3
2	BSCCSPS201	Data Structures Lab	Practical	4	40	10	50	2

Semester III								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BSCCSCS301	Object Oriented Programming using Java	Core	4	80	20	100	3
2	BSCCSPS301	Object Oriented Programming Lab using Java	Practical	4	40	10	50	2
2	BSCCSES301 to BSCCSES303	A. Digital Marketing B. Web Content Management C. Computer Organization	Elective	2	40	10	50	2

Semester IV								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BSCCSCS401	Database Management System	Core	4	80	20	100	3
2	BSCCSPS401	DBMS-Lab	Practical	4	40	10	50	2
3	BSCCSES401 to BSCCSES403	A) Cloud Computing B) WEB design Basics C) Cyber Security	Elective	2	40	10	50	2
4	BSCCSSS403	Data Analytics using Excel	Compulsory	2	40	10	50	2

Semester V								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BSCCSCS501	Programming in Python	Core	3	80	20	100	3
2	BSCCSCS502	Operating Systems	Core	3	80	20	100	3
3	BSCCSPS501	Python and Linux - Lab	Practical	4	40	10	50	2
4	BSCCSSS503	Artificial Intelligence	Compulsory	2	40	10	50	2

Semester VI								
Sl No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BSCCSCS601	Statistical Computing and R Programming	Core	3	80	20	100	3
2	BSCCSCS602	Web Technologies	Core	3	80	20	100	3
3	BSCCSPS601	R Programming and Web Technologies Lab	Practical	4	40	10	50	2
4	BSCCSSS603	Computer Hardware and Maintenance	Compulsory	2	40	10	50	2

SEMESTER III

Program Name	BSC-COMPUTER SCIENCE	Semester	III
Course Title	Object Oriented Programming using Java (Theory)		
Course Code:	BSCCSCS301	No. of Credits	03
Contact hours	4 Hours per week	Duration of Exam/SEE	3 hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Understand the features of Java and the architecture of JVM
- Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done
- Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance
- Demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Languages
- Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

	swing. Java Database Connectivity: JDBC Driver Types, JDBC Packages, Overview of the JDBC process, Database Connection.		Chapter 20 Chapter 27- Pg. 837 – 840 Study Material for JDBC
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Text Books:

1. Programming with Java, E Balagurusamy – A Primer, 4th Edition, McGraw Hill Publication.
2. Java - The Complete Reference, Herbert Schildt, 7th Edition, McGraw Hill Publication, 2017

References:

1. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall.
2. Object Oriented Programming with Java: Somashekara M.T., Guru, D.S., Manjunatha K.S, 1st Edition, PHI Learning 2017.

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Program Name	BSC-COMPUTER SCIENCE	Semester	III
Course Title	Java Programming Lab		
Course Code:	BSCCSPS301	No. of Credits	02
Contact hours	52 Hours	Duration of Exam/SEE	3 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Java Programming Lab

List of programs

PART-A

1. Program to print all Fibonacci numbers between the range. (Use for loop)
2. Program which reads two numbers having same number of digits. The program should output the sum of product of corresponding digits. (Hint Input 327 and 539 output $3 \times 5 + 2 \times 3 + 7 \times 9 = 84$)
3. Program to find the biggest and smallest number in 3 x 3 array. The program should receive the 9 integers as command line arguments.
4. Define a class named Pay with data members String name, double salary, double da, double hra, double pf, double grossSal, double netSal and methods: Pay(String n, double s) - Parameterized constructor to initialize the data members, void calculate() - to calculate the following salary components, and void display() - to display the employee name, salary and all salary components.

Dearness Allowance = 15% of salary

House Rent Allowance = 10% of salary

Provident Fund = 12% of salary

Gross Salary = Salary + Dearness Allowance + House Rent Allowance

Net Salary = Gross Salary - Provident Fund

Write a main method to create object of the class and call the methods to compute and display the salary details. [class basics]

5. Given two strings, a and b, print a new string which is made of the following combination- first character of a, the first character of b, second character of a, second character of b and

so on. Any characters left, will go to the end of the result.

Example:

Input: Hello,World Output: :HWeolrllod

6. Write a Program to take care of Number Format Exception if user enters values other than integer for calculating average marks of n students.
The name of the students and marks in 3 subjects are taken from the user while executing the program.
In the same Program write your own Exception classes to take care of Negative values and values out of range (i.e. other than in the range of 0-100)
7. Create a package to calculate volume of cube, and one more package to calculate the simple Interest. Implement both package in the Main () by accepting the required inputs for each application

PART-B

1. Create a school application with a class called Person. Create name and dateOfBirth as member variables.
Create a class called Teacher that inherits from the Person class. The teacher will have additional properties like department, and the subject that the teacher teaches.
Create a class called Salary that inherits from the Teacher class. The Salary will have additional properties like basic. And method to calculate the DA, HRA, PF, IT, GROSS and NETPAY using appropriate condition.
If Basic $\leq$ 20000 D.A is 40% Basic H.R.A is 10% Basic.
P.F 12% of Gross; PT is Rs .100
If Basic $>$ 20000 D.A is 50% Basic. H.R.A 15% Basic.
P.F 12% of Gross ; PT is Rs.150
Gross = Basic.+D.A +HRA and Net = Gross -PT –PF
Create a class called Student that inherits from Person class. This class will have a member variable called studentId.
Create a class called College Student that inherits from Student class. This class will have collegeName, the year in which the student is studying (first/second/third/fourth)etc.
Create objects of each of these classes, invoke and test the methods that are available in these classes.
2. Write a program that implements a multi-threaded program has three threads. First thread generates a random integer every second, and if the value is even, second thread computes the square of the number and prints. If the value is odd the third thread will print the value of cube of the number.
[Multithreading]
3. Write a program to separate odd and even numbers from the file NUMBER.txt and placed in two files OOD.txt and EVEN.txt. Write the numbers along with its corresponding count in an output file.
4. Write a Program to calculate marks of a student using multiple inheritance implemented through interface. Class Student with data members rollNo, name, String cls and methods to set and put

data. Create another class test extended by class Student with data members mark1, mark2, mark3 and methods to set and put data. Create interface sports with members sportsWt = 5 and putWt(). Now let the class results extends class test and implements interface sports. Write a Java program to read required data and display details in a neat format.

5. Create a package to convert temperature in centigrade into Fahrenheit, and one more package to calculate the simple Interest. Implement both package in the Main () by accepting the required inputs for each application.
6. Program that creates a user interface to perform basic integer operations.
The user enters two numbers in the TextFields - Num1 and Num2. The result of operations must be displayed in the Result TextField when the “=” button is clicked. Appropriate Exception handling message to be displayed in the Result TextField when Num1 or Num2 is not an integer or Num2 is Zero when division operation is applied.
7. Write a JDBC program to create a Bank database with fields Acc_no, Acc_name, Balance. Perform these operations
 - a) Insert the Account Holder information from the keyboard.
 - b) Amount Deposited
 - c) Amount Withdraw (Maintain minimum balance 500 Rs).
 Display all information. (Use proper validation).

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing: 5 Marks Logic: 5 Marks Execution: 5 Marks	15 Marks
Program-2	PART-B Writing: 7 Marks Logic: 7 Marks Execution: 6 Marks	20 Marks
Practical Record		05 Marks
Total		40 Marks

Program Name	BSC-COMPUTER SCIENCE	Semester	III
Course Title	Digital Marketing (Elective)		
Course Code:	BSCCSES301	No. of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 Hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Understand the fundamental concepts and principles of digital marketing.
- Develop practical skills to implement various digital marketing strategies and techniques
- Analyze and evaluate the effectiveness of digital marketing campaigns.
- Apply critical thinking and problem-solving skills to real-world digital marketing scenarios.
- Create comprehensive digital marketing plans and strategies

Unit	Description	Hours
1	Introduction to Digital Marketing: Overview of digital marketing, Evolution of digital marketing, Importance and benefits of digital marketing, Digital marketing channels and platforms Digital Marketing Strategy and Planning: Developing a digital marketing strategy, Setting goals and objectives, Budgeting and resource allocation. Campaign planning and execution, Monitoring and adjusting digital marketing campaigns	8

2	Social Media Marketing: Overview of social media marketing, social media platforms and their features, Creating and optimizing social media profiles, social media content strategy, social media advertising and analytics Email Marketing: Introduction to email marketing, building an email list, Creating effective email campaigns, Email automation and segmentation, Email marketing metrics and analytics	8
3	Mobile Marketing: Mobile marketing overview, Mobile advertising strategies, Mobile app marketing, Location-based marketing, Mobile marketing analytics Analytics and Reporting: Importance of analytics in digital marketing, setting up web analytics tools (e.g., Google Analytics), Tracking and measuring key performance indicators (KPIs), Conversion tracking and optimization, Reporting and data visualization	10
Text Books: 1. "Digital Marketing Strategy: An Integrated Approach to Online Marketing" by Simon Kingsnorth. References 1. "Email Marketing Rules: How to Wear a White Hat, Shoot Straight, and Win Hearts" by Chad S. White 2. "Content Inc.: How Entrepreneurs Use Content to Build Massive Audiences and Create Radically Successful Businesses" by Joe Pulizzi 3. "Mobile Marketing: How Mobile Technology is Revolutionizing Marketing, Communications and Advertising" by Daniel Rowles 4. "Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity" by Avinash Kaushik		

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Program Name	BSC-COMPUTER SCIENCE	Semester	III
Course Title	Web Content Management. (Elective)		
Course Code:	BSCCSES302	No. of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Understand content development basics.
- Gain Knowledge of tools for multimedia content development for audio/ video, graphics, animations, presentations, screen casting.
- Host websites and develop content for social media platforms such as wiki and blog
- Understand e-publications and virtual reality
- Understand the e-learning platform Moodle and CMS applications Drupal and Joomla

Unit	Description	Hours
1	Web Content Development and Management, Content Types and Formats, Norms and Guidelines of Content Development, Creating Digital Graphics, Audio Production and Editing.	8
2	Web Hosting and Managing Multimedia Content, Creating and Maintaining a Wiki Site. Presentation Software Part , Screen casting Tools and Techniques, Multilingual Content Development.	8
3	Planning and Developing Dynamic Web Content Sites, Website Design Using CSS Creating and Maintaining a WIKI Site, Creating and Managing a Blog Site. Content Management System: Joomla, Content Management System: Drupal	10

Text Book:

1. Web Content Management: Systems, Features, and Best Practices 1st Edition by Deane Barker.

Reference Books:

1. Content Management Bible (2nd Edition) 2nd Edition by Bob Boiko.
2. Using Joomla!: Efficiently Build and Manage Custom Websites 2nd Edition by Ron Severdia

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Program Name	BSC-COMPUTER SCIENCE	Semester	III
Course Title	Computer Organization (Elective)		
Course Code:	BSCCSES303	No. of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Boolean algebra concepts, various design Components of Computer System like logical gates and combinational circuits.
- Understand Digital computer and digital systems functioning

Unit	Description	Hours
1	Digital Computers and Digital System: Introduction to Number System, Decimal number, Binary number, Octal and Hexadecimal numbers, Number base conversion, Complements, Binary codes, Binary arithmetic, Addition, Subtraction in the 1's and 2's complements system, Subtraction in the 9's and 10's complement system.	8
2	Boolean Algebra: Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Venn diagram. Digital logical gate: Boolean functions, Canonical and Standard forms, Minterms, Maxterms, other logic operations, Digital logic gates, Universal gates.	8
3	Simplification of Boolean function: The map method, Two and three variable maps, four variable maps, Don't care conditions, Product of sum simplification. Combinational Logic: Introduction, Design Procedure, Half adder, Full adder, half Subtractor, Full Subtractor	10

Text Books:

1. M. Morris Mano, Digital Logic and Computer design, PHI, 2015

References

1. Thomas L Floyd, Digital Fundamentals, 10th Edition, Pearson, 2011.
2. Thomas. C. Bartee, Digital Computer Fundamentals, 6th edition, TMH

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

SEMESTER IV

Program Name	BSC-COMPUTER SCIENCE	Semester	IV
Course Title	Database Management System (Theory)		
Course Code:	BSCCSCS401	No. of Credits	03
Contact hours	52 Hours	Duration of Exam/SEE	3 hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

At the end of the course, students will be able to:

- Understand the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and design ER diagrams for given real-world problems.
- Represent ER model to relational model and its implementation through SQL.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Understand the transaction processing and concurrency control techniques.

Unit	Description	Hours
1	Database Architecture: Introduction to Database system applications. Characteristics, Data models, Database schema, Database architecture, Data independence, Database languages, GUIs, and Classification of DBMS. E-R Model: E-R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship	13

	types, Roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	
2	Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constraints, key constraints, primary & foreign key constraints, integrity constraints and null values. Data Normalization: Functional dependencies. Normalization. First normal form, second normal form, Third normal form. Boyce-Codd normal form.	13
3	INTERACTIVE SQL: Table fundamentals, oracle data types, CREATE TABLE command, inserting data into table, Viewing Data in the table, sorting data in a table, creating a table from a table, inserting data into a table from another table, delete operations, Updating the contents of a table, Modifying the structure of tables, renaming tables, destroying tables, displaying table structure. DATA CONSTRAINTS: Types of data constraints, IO constraints-The PRIMARY KEY constraint, The FOREIGN KEY constraint, The UNIQUE KEY constraint, Business Rule Constraints- NULL value concepts, NOT NULL constraints, CHECK constraint, DEFAULT VALUE concepts. COMPUTATIONS ON TABLE DATA: Arithmetic Operators, Logical Operators, Range Searching, Pattern Matching, Oracle Table – DUAL, Oracle Function- Types, Aggregate Function, Date Conversion Function. GROUPING DATA FROM TABLES IN SQL, Group By clause, Having clause, subqueries, JOINS, Using the UNION, INTERSECTION, MINUS clause	13
4	INTRODUCTION TO PL/SQL: Advantages of PL/SQL, The Generic PL/SQL Block, PL/SQL The character set, Literals, PL/SQL datatypes, variables, Logical comparisons, Displaying User Messages on The VDU Screen, comments. Control Structure - Conditional Control, Iterative Control PL/SQL Transactions: Cursor-Types of Cursors, Cursor Attributes. Explicit cursor- Explicit cursor Management, cursor for loop. PL/SQL Database Objects: Procedures and Functions, Oracle Packages, Database Triggers, Error Handling in PL/SQL.	13
Text Book: 1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015		

Reference Books:

1. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
2. Introduction to Database System, C J Date, Pearson, 1999.
3. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6th Edition, McGraw Hill, 2010.
4. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition, McGraw Hill, 2002

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Program Name	BSC-COMPUTER SCIENCE	Semester	IV
Course Title	DBMS Lab		
Course Code:	BSCCSPS401	No. of Credits	02
Contact hours	52	Duration of Exam/SEE	3 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

DBMS Lab PART-A

1. Create a table EMPLOYEE using SQL command to store details of employees such as EMPNO, NAME, DESIGNATION, DEPARTMENT, GENDER and SALARY. Specify Primary Key and NOT NULL constraints on the table.

Allow only 'M' or 'F' for the column GENDER.

DEPARTMENT can be SALES, ACCOUNTS, IT.

Choose DESIGNATION as CLERK, ANALYST, MANAGER, ACCOUNTANT and SUPERVISOR that depends on department

Write the following SQL queries:

- a) Display *EMPNO*, *NAME* and *DESIGNATION* of all employees whose name ends with RAJ.
 - b) Display the details of all female employees who is earning salary within the range 20000 to 40000 in SALES or IT departments
 - c) List the different DEPARTMENTS with the DESIGNATIONS in that department.
 - d) Display the department name, total, average, maximum, minimum salary of the DEPARTMENT only if the total salary given in that department is more than 30000.
 - e) List the departments which have more than 2 employees.
2. Create a table CLIENT to store CLIENT_NO, NAME, ADDRESS, STATE, BAL_DUE. Client no must start with 'C'. Apply the suitable structure for the columns. Specify Primary Key and NOT NULL constraints on the table. Insert 10 records.

Write the following SQL queries:

- a) From the table CLIENT, create a new table CLIENT1 that contains only CLIENT_NO and NAME, BAL_DUE from specified STATE. Accept the state during run time.
- b) create a new table CLIENT2 that has the same structure as CLIENT but with no records. Display the structure and records.
- c) Add a new column by name PENALTY number (10, 2) to the CLIENT
- d) Assign Penalty as 10% of BAL_DUE for the clients C1002, C1005, C1009 and for others 8%. Display Records

- e) Change the name of CLIENT1 as NEW_CLIENT
- f) Delete the table CLIENT2

3. Create a table BOOK using SQL command to store Accession No, TITLE, AUTHOR, PUBLISHER, YEAR, PRICE. Apply the suitable structure for the columns. Specify Primary Key and NOT NULL constraints on the table. Insert 10 records.

Write the following SQL queries:

- a) List the details of publishers having 'a' as the second character in their names.
- b) Display Accession No., TITLE, PUBLISHER and YEAR of the books published by the specified author before 2010 in the descending order of YEAR. Accept author during run time
- c) Modify the size of TITLE to increase the size 5 characters more.
- d) Display the details of all books other than Microsoft press publishers.
- e) Remove the records of the books published before 1990.

4. Create a table SALES with columns SNO, SNAME, MNO , JOIN_DATE, DATE_BIRTH, SALARY,SALES_AMOUNT and COMMISSION. Minimum age for joining the company must be 18 Yrs. Default value for Commission should be 0. Apply the suitable structure for the columns. Specify Primary Key and NOT NULL constraints on the table. Insert 10 records with data except commission. Manager of Manager can be NULL.

Write the following SQL queries:

- a) Display the details of Sales Persons whose salary is more than Average salary in the company.
 - b) Update commission as 20% of Sales Amount.
 - c) Display SNO, SNAME, MNO, SALARY, COMMISSION, MANAGER_SALARY of the sales persons getting sum of salary and commission more than salary of manager. (Self-join)
 - d) Display the records of employees who finished the service of 10years
5. Create a table Sales_Details with the columns SNO, MONTH, TARGET and QTY_SOLD to store the Sales Details of one year. Specify the composite primary key to the columns SNO and MONTH. TARGET and SALES must be positive numbers.

Write the following SQL queries:

- a) Display the total sales by each sales person considering only those months sales where target was reached
 - b) If a commission of RS.50 provided for each item after reaching target, calculate and display the total commission for each sales person.
 - c) Display the SNO of those who never reached the target.
 - d) Display the SNO, MONTH and QTY_SOLD of the sales persons with SNO S0001 or S0003
6. Create the following tables by identifying primary and foreign keys. Specify the not null property for mandatory keys. SUPPLIERS (SUPPLIER_NO, SNAME, SADDRESS, SCITY) COMPUTER_ITEMS (ITEM_NO, SUPPLIER_NO, ITEM_NAME, IQANTITY) Consider three

suppliers. A supplier can supply more than one type of items.

Write the SQL queries for the following:

- a.) List ITEM and SUPPLIER details in alphabetical order of city name and in each city decreasing order of IQANTITY.
 - b.) List the name, city and address of the suppliers who are supplying keyboard.
 - c.) List the supplier name, items supplied by the suppliers 'Cats' and 'Electrotech'.
 - d.) Find the items having quantity less than 5 and insert the details of supplier and item into another table NEWORDER
7. Create the following tables identifying Primary and Foreign keys. Specify the not null property for mandatory keys. EMPLOYEE_MASTER (EMP_ID, EMP_NAME, EMAIL_ID, EMP_ADDRS, PHONE) ATTENDANCE (EMP_ID, MONTH, WOM, MHR, THRS, WHRS, TRHRS, FHRS, SHRS, SUHRS). (Valid values for WOM ≤ 5, MONTH can be 1-12). Apply appropriate constraints. Consider 3 employees. And attendance records for at least two months. Write the SQL queries for the following:
- a) Display EMP_ID, EMP_NAME and EMAIL_ID of all employees who are working on every Sunday of 2nd and 4th week in a month.
 - b) Display total hours worked by each employee in each month with EMP_ID.
 - c) Display the names of the employees who never attended the duty so far (Attendances not given so far).
 - d) Display the employee's name, month, week, total hours worked for employees who have total no. of hours more than 20 hrs a week.

PART-B

8. Write a PL/SQL program to accept the students rollno, name and their marks in 3 subjects from a base table Student (having RollNo, Sname, Marks in three subjects) and declare the result based on the following rules:

- i). If student has scored below 35 in any subject he/she is declared as FAIL.
- ii). If the Total ≥ 180 then declare the result as I CLASS
- iii). If the Total ≥ 150 but < 180 then declare the result as II CLASS
- iv). If the Total < 120 then declare the result as III CLASS.

Assume the records of 5 students. Create an output which contains the roll number, name of the student, marks in 3 subjects, total mark and result in the following format.

=====

ROLLNO NAME MARK1 MARK2 MARK3 TOTAL RESULT

=====

9. Create a table Bank with the columns ACNO, ACT_NAME, ACT_TYPE and BAL. Specify the Primary Key. Initial BAL must be greater than 500.

Write a PL/SQL program to perform debit operation by providing acct_no and amount required. The amount must be greater than 100 and less than 20000 for one transaction. If the account exist and BAL-amount>500 Bank table must be updated, otherwise "NO SUFFICIENT BALANCE" message should be displayed. If account number is not present then display "NO SUCH ACCOUNT" message to the user.

10. Write a PL/SQL program to compute the selling price of books depending on the book code and category. Use Open, Fetch and Close. The Book_detail table contains columns: Book Code, Author, Title, Category and Price. Insert 10 records. The selling price=Price-Discout.

The discount is calculated as follows:

Book Code	Category	Discount Percentage
A	Novels	10% of Price
	Technology	12.5% of Price
B	Commerce	18% of Price
	Science	19% of Price
C	Songs	25% of Price
	Sports	24% of Price
D	All	28% of Price

Print the result in tabular form with proper alignment

**Book Code category title author price discount%
discountamount sell price**

11. Write a PL/SQL program to display employee pay bill (using Cursor For loop) Use a Procedure to receive basic pay and to compute DA, HRA, Tax, PF, Gross Pay and Net Pay(Use OUT). Base table contains the following columns empnum, empname, basic pay. Insert 3 records. Allowances are computed as follows.

Basic Pay	DA	HRA
<=20000	35% of Basic	8% of Basic
>20000 & <=30000	38%	9%
>30000 & <=40000	40%	10%
>40000	45%	10%

Gross=Basic+DA+HRA

PF=12% of Gross or Rs. 2000 whichever is minimum.

PT=Rs. 100 upto Gross is 25,000 else Rs. 200.

Net=Gross-(PF+PT)

Print Pay slip as follows

```
=====PAYSLIP=====
Empno      :10011      Empname : Raj
Basic Pay  :20000      P.F.: 3432
DA         :7000       P.T.: 200
H.R.A.     :1600
Gross      :28600      Net Pay : 24968
=====
=====PAYSLIP=====
Empno      :10012      Empname : Rani
Basic Pay  :30000      P.F.: 5292
DA         :11400      P.T.: 200
H.R.A.     :2700
Gross      :44100      Net Pay : 38608
=====
```

12. Given the following tables

ITEM_MASTER (Item_No,Item_Name, Stock, Unit_Price)

ITEM_TRANS (Item_No,Qty, Trans_Date)

Write a function to check whether the item exists in ITEM_MASTER. Write a main program such that if the function returns a value 1, add a record to ITEM_TRANS with a given Item_No, Qty and today's date as Trans_Date, otherwise display an appropriate error message.

13. Create a trigger to update the MASTER table when a record is inserted into SALES table and create another trigger to update the MASTER table when a record is inserted or updated or deleted in NEWSTOCK table. Assume the suitable columns for all the tables.

14. Create a package which includes a function to compute the factorial of a number, a procedure to compute the value of nCr, and another procedure to compute nPr both uses the factorial function. Execute the package program for the required calculation.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing: 5 Marks Logic: 5 Marks Execution: 5 Marks	15 Marks
Program-2	PART-B Writing: 7 Marks Logic: 7 Marks Execution: 6 Marks	20 Marks
Practical Record		05 Marks
Total		40 Marks

Program Name	BSC-COMPUTER SCIENCE	Semester	IV
Course Title	WEB design Basics (ELECTIVE)		
Course Code:	BSCCSEC401	No. of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand the fundamentals of HTML5 and its evolution from previous versions.
- Identify the structure and components of an HTML5 document.
- Utilize HTML5 semantic elements to create well-structured web pages.
- Implement multimedia elements such as audio and video using HTML5.
- Demonstrate the use of HTML5 forms and input types for user data collection.
- Apply best practices for web accessibility and SEO in HTML5 documents.

Unit	Description	Hours
1	Introduction to Computers and the Internet-Introduction, The Internet in Industry and Research, Evolution of the Internet and World Wide Web, Web Basics. Introduction to HTML5: Introduction, Editing HTML5, First HTML5 Example, W3C HTML5 Validation Service, Headings, Linking, Images, Special Characters and Horizontal Rules, Lists, Tables, Forms, Internal Linking, meta-Elements.	8

	New HTML5 Form input Types, input and data list Elements and autocomplete Attribute, Page-Structure Elements.	
2	Cascading Style Sheets-Introducing CSS, Add CSS Rules, CSS Properties-Controlling Fonts, Text Formatting, Text Pseudo-Classes, Selectors, Lengths, and Percentages.	8
3	More Cascading Style Sheets: Links, Backgrounds, Lists, Tables, Outlines, The: focus and: active Pseudo-Classes.	10

Text Books:

1. Deitel, Paul_Deitel, Harvey_Deitel, Abbey - Internet and World Wide Web How to Program-Pearson Education (US) (2011)
2. Jon Duckett -Beginning Web Programming with HTML, XHTML, and CSS (Wrox Beginning Guides)-Wrox (2004)

References:

1. The Complete Reference HTML and CSS, 5th Edition, Thomas A Powell, 2017.
2. Animation in HTML, CSS, and JavaScript, KirupaChinnathambi, 1st Edition, Createspace Independent Pub, 2013
3. Web Programming with HTML5, CSS, and JavaScript-John Dean

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Program Name	BSC-COMPUTER SCIENCE	Semester	IV
Course Title	Cyber Security (ELECTIVE)		
Course Code:	BSCCSES402	No.of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Understand the concept of Cyber security and issues and challenges associated with it.
- Understand the cybercrimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.
- Appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.
- On completion of this course, students should be able to appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

Unit	Description	Hours
1	INTRODUCTION TO CYBERCRIME: Cybercrime - Definition and Origins of the Word, Cybercrime and Information Security, Who are Cyber criminals? Classifications of Cyber Crimes, A Global Perspective on Cybercrimes, Cybercrime Era: Survival Mantra for the Netizens, Cyber Offences: How Criminals Plan Them, How Criminals Plan the Attacks, Social Engineering, Cyberstalking, Cyber cafe and Cybercrimes. Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing. Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices.	8

2	Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones. Mobile Devices: Security Implications for organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era. Tools and methods used in cybercrime: Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan-horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks. Phishing and Identity Theft: Introduction to Phishing, Identity Theft (ID Theft).	10
3	Social Media Overview and Security: Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.	8

Text Books:

1. SunitBelapure and Nina Godbole, "Cyber Security: Understanding Cyber Crimes,
2. ComputerForensicsAndLegalPerspectives", WileyIndiaPvtLtd, ISBN:978-81-265-21791, Publish Date 2013.
3. Dr. Surya Prakash Tripathi, Ritendra Goyal, Praveen Kumar Shukla, KLSI.
4. "Introduction to information security and cyber laws". DreamtechPress. ISBN: 9789351194736, 2015.
5. Thomas J. Mowbray, "Cybersecurity: Managing Systems, Conducting Testing, andInvestigatingIntrusions", Copyright © 2014 by John Wiley & Sons, Inc

References

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
2. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001
3. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd
4. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
5. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
6. Fundamentals of Network Security by E. Maiwald, McGraw Hill

Program Name	BSC-COMPUTER SCIENCE	Semester	IV
Course Title	Cloud Computing (Elective)		
Course Code:	BSCCSES403	No.of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Explain the core concepts of the cloud computing paradigm such as how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- Apply the fundamental concepts in data centers to understand the trade-offs in power, efficiency and cost.
- Identify resource management fundamentals like resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
- Analyze various cloud programming models and apply them to solve problems on the cloud.

Unit	Description	Hours
1	Introduction: Different Computing Paradigms- Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing etc., Comparison of various Computing Technologies; Cloud Computing Basics- What is Cloud Computing? History, Characteristic Features, Advantages and Disadvantages, and Applications of Cloud Computing; Trends in Cloud Computing; Leading Cloud Platform Service Providers.	8

2	Cloud Architecture: Cloud Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS), Comparison of different Service Models; Cloud Deployment Models- Public Cloud; Private Cloud, Hybrid Cloud, Community Cloud; Cloud Computing Architecture- Layered Architecture of Cloud. Virtualization- Definition, Features of Virtualization; Types of Virtualizations- Hardware Virtualization, Server Virtualization, Application Virtualization, Storage Virtualization, Operating System Virtualization; Virtualization and Cloud Computing, Pros and Cons of Virtualization.	8
3	Cloud Application Programming and the Aneka Platform: Aneka Cloud Application Platform- Framework Overview, Anatomy of the Aneka Container; Building Aneka Clouds (Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode); Cloud Programming and Management- Aneka SDK (Application Model and Service Model); Management Tools (Infrastructure, Platform and Application management).	10
Text Books: 1. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi: "Mastering Cloud Computing- Foundations and Applications Programming", Elsevier, 2013 References Books: 1. Barrie Sosinsky: "Cloud Computing Bible", Wiley-India, 2010 2. K Chandrashekar: "Essentials of Cloud Computing", CRC Press, 2015 3. Derrick Rountree, Ileana Castrillo: "The Basics of Cloud Computing", Elsevier, 2014		

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Program Name	BSC-COMPUTER SCIENCE	Semester	IV
Course Title	Data Analytics using Excel (Compulsory) Practical Knowledge/Skill Course		
Course Code:	BSCCSSS403	No.of Credits	02
Contact hours	26 Hours	Duration of Exam/SEE	2 hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcome:

After completing this course, a student will be able to:

- Demonstrate data manipulation, analysis, and visualization tasks.
- Create and apply basic and advanced formulas in Excel, including functions
- Develop skills in data analysis techniques such as sorting, filtering, and using PivotTables to summarize and analyze data effectively.
- Utilize Excel tools for tasks such as splitting screens, renaming spreadsheets, and copying and pasting data between spreadsheets.
- Create various types of charts in Excel, and format and customize these charts to effectively present data in real-world scenarios that require strong data analysis and presentation skills.

Works to be carried out by the students

1	Use TEXTSPLIT() and TEXTJOIN() text functions to extract First Name, Last Name and generate email ID in the format Lastname_Firstname@gmail.com <table><tr><th>Sl.No</th><th>Name</th><th>First Name</th><th>Last Name</th><th>Email ID</th></tr><tr><td>1</td><td>Asha Dsouza</td><td>Asha</td><td>DSouza</td><td>dsouza_asha@gmail.com</td></tr><tr><td>2</td><td>Praneetha Shetty</td><td></td><td></td><td></td></tr><tr><td>3</td><td>Vishal Thakur</td><td></td><td></td><td></td></tr><tr><td>4</td><td>Vinyas Salian</td><td></td><td></td><td></td></tr><tr><td>5</td><td>Nikhil Kamath</td><td></td><td></td><td></td></tr></table>	Sl.No	Name	First Name	Last Name	Email ID	1	Asha Dsouza	Asha	DSouza	dsouza_asha@gmail.com	2	Praneetha Shetty				3	Vishal Thakur				4	Vinyas Salian				5	Nikhil Kamath			
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2	(a) Use MMULT() function to Multiply 1) Two 3x3 Matrices 2)Two 4x4 matrices (b) Use MINVERSE() function to find the Inverse of a Matrix																														
3	Plot a graph for a quadratic Equation $f(x) = ax^2+bx+c$ Hint: Use Scatter Plot by finding the values of $f(x)$ for various values <table><tr><th>Values</th><th>Function $f(x)= 2x^2+5x+3$</th></tr><tr><td>-4</td><td>$2*(-4*-4)+5*(-4)+3$</td></tr><tr><td>-3</td><td>$2*(-3*-3)+5*(-3)+3$</td></tr><tr><td>-2</td><td></td></tr><tr><td>-1</td><td></td></tr><tr><td>0</td><td></td></tr><tr><td>1</td><td></td></tr><tr><td>2</td><td></td></tr><tr><td>3</td><td></td></tr><tr><td>4</td><td></td></tr></table>	Values	Function $f(x)= 2x^2+5x+3$	-4	$2*(-4*-4)+5*(-4)+3$	-3	$2*(-3*-3)+5*(-3)+3$	-2		-1		0		1		2		3		4											
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4	A worksheet contains name and marks in 3 subjects . Calculate Total Marks Also do the following: a) Construct 3D Pie Chart for Total marks b) Construct 2D Line Chart for Subject 1 and Subject 3 c) Construct 2D Column Chart for Sub1,Sub2,Sub3 d) Construct Stacked Column Chart for Sub1,Sub2,Sub3 <table><tr><td></td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>1</td><td>NAME</td><td>SUB 1</td><td>SUB 2</td><td>SUB 3</td><td>TOTAL MARKS</td></tr><tr><td>2</td><td>Deep</td><td>30</td><td>34</td><td>44</td><td></td></tr><tr><td>3</td><td>Jayesh</td><td>40</td><td>35</td><td>45</td><td></td></tr><tr><td>4</td><td>Yash</td><td>45</td><td>36</td><td>47</td><td></td></tr><tr><td>5</td><td>Sara</td><td>48</td><td>32</td><td>50</td><td></td></tr><tr><td>6</td><td>Gita</td><td>35</td><td>32</td><td>43</td><td></td></tr><tr><td>7</td><td>Jinal</td><td>32</td><td>31</td><td>37</td><td></td></tr><tr><td>8</td><td>Kavita</td><td>36</td><td>28</td><td>38</td><td></td></tr><tr><td>9</td><td>Minal</td><td>23</td><td>25</td><td>40</td><td></td></tr><tr><td>10</td><td>Naresh</td><td>43</td><td>27</td><td>50</td><td></td></tr><tr><td>11</td><td>Rima</td><td>37</td><td>44</td><td>46</td><td></td></tr></table>		A	B	C	D	E	1	NAME	SUB 1	SUB 2	SUB 3	TOTAL MARKS	2	Deep	30	34	44		3	Jayesh	40	35	45		4	Yash	45	36	47		5	Sara	48	32	50		6	Gita	35	32	43		7	Jinal	32	31	37		8	Kavita	36	28	38		9	Minal	23	25	40		10	Naresh	43	27	50		11	Rima	37	44	46	
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11	Rima	37	44	46																																																																					
5	Create a worksheet containing an Orders table with the following fields: Order ID, Order Date, Country, Ship Via, Freight. Using Microsoft Excel, perform the following operations: a) Create a summary from the given data to display the total Freight for each Country. b) Represent this summary using a bar chart. c) Modify the chart by removing the chart title, legend, and field buttons, and then resize and position the chart neatly in the space provided. d) Add a time-based filter based on the <i>Order Date</i> field and change its display to show Years. Resize and place it appropriately.																																																																								
6	Prepare a worksheet containing sales data with the columns: <i>Date, Product Name, Category, Quantity, and Unit Price</i>. Perform the following tasks: a) Subtotal - Sort the data by <i>Category</i>. - Insert subtotals to calculate the total Unit Price for each Category. b) Advanced Filter - Use Advanced Filter to display only the records where Category is “Electronics” and Unit Price is greater than 1000. - Copy the filtered result to another location in the worksheet. c) Use VLOOKUP to find the Unit Price of a product when the Product Name is entered in a cell. Use HLOOKUP to retrieve the Unit Price for a given Product Name.																																																																								
7	Using appropriate Dataset to create a DASHBOARD.																																																																								

Evaluation:

The report shall be prepared by the student under the guidance of the identified mentor in the college and submitted to the Head of the Department for evaluation. The report shall be evaluated by the two internal faculty members and submit the summative marks to the university.

Scheme of valuation:

Internal Assessment	10 Marks (C1) Basis for Internal Assessment Continuous Evaluation: 10 Marks
Evaluation of Report	40 Marks (C2) i) Preparation and presentation: 20 Marks ii) Viva-Voce: 10 Marks iii) Record Book: 10 Marks

Pedagogy: Lecture/ PPT/ Videos/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/Problem Solving/Trouble shooting.

Question Paper Pattern for Core Subjects

Duration: 3 Hours

Max. Marks: 80

*Note: Answer any **ten** Questions from Part-A and one full Questions from each unit of Part-B*

PART-A

1.

10 x 2=20

- a.
- b.
- c.
- d.
- e.
- f.
- g.
- h.
- i.
- j.
- k.
- l.

PART-B

There are 4 Units - UNIT-I, II, III, IV

Each unit contains 2 main questions and it carry 15 marks.
Each main question contains 2 or more sub questions.

4 x 15=60

UNIT-I

- 2 a)
- b)
- c)
- 3. a)
- b)
- c)

Same pattern for UNIT – II , UNIT - III and UNIT - IV

Question Paper Pattern for Elective and Compulsory Subjects

Duration: 2 Hours

Max. Marks: 40

Note: Answer any five Questions from Part-A and one full Questions from each unit in Part-B

PART-A

1.

5 x 2=10

- a.
- b.
- c.
- d.
- e.
- f.
- g.
- h.

PART-B

There are 3 Units - UNIT-I, II, III

Each unit contain two main questions and it carry 10 Marks. 3 x 10=30
Each main questions contain 2 or more sub question.

UNIT-I

2.

- a.
- b.
- c.

3.

- a.
- b.
- c.

Same pattern for UNIT – II and UNIT - III