



Department of Higher Education U.P. Government, Lucknow

National Education Policy-2020

Common Minimum Syllabus for all U.P. State Universities
Year wise Structure of B.Sc. (Computer Science)

| Year | Sem. | Course Code | Paper Title | Theory/Practical | Credits |
|------|------|-------------|--|------------------|---------|
| 1 | I | B070101T | Problem Solving using Computer | Theory | 4 |
| 1 | I | B070102P | Software Lab using Python | Practical | 2 |
| 1 | II | B070201T | Database Management Systems | Theory | 4 |
| 1 | II | B070202P | Database Management Systems Lab | Practical | 2 |
| 2 | III | B070301T | Operating Systems | Theory | 4 |
| 2 | III | B070302P | Operating Systems Lab | Practical | 2 |
| 2 | IV | B070401T | Computer System Architecture | Theory | 4 |
| 2 | IV | B070402P | Computer System Architecture Lab | Practical | 2 |
| 3 | V | B070501T | Analysis of Algorithms and Data Structures | Theory | 4 |
| 3 | V | B070502T | Soft Computing | Theory | 4 |
| 3 | V | B070503P | Lab on Algorithms and Data Structures with C++ | Practical | 2 |
| 3 | V | B070504R | Research Project-I | Project | 3 |
| 3 | VI | B070601T | Data Communication and Computer Networks | Theory | 4 |
| 3 | VI | B070602T | Cyber Security & Cyber Laws | Theory | 4 |
| 3 | VI | B070603P | Lab on Computer Networks | Practical | 2 |
| 3 | VI | B070604R | Research Project-II | Project | 3 |

| Name | Designation | Affiliation |
|---|---|--|
| Steering Committee | | |
| Mrs. Monika S. Garg, (I.A.S.) Chairperson Steering Committee | Additional Chief Secretary | Dept. of Higher Education U.P., Lucknow |
| Prof. Poonam Tandan | Professor, Dept. of Physics | Lucknow University, U.P. |
| Prof. Hare Krishna | Professor, Dept. of Statistics | CCS University Meerut, U.P. |
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| Supervisory Committee-Science Faculty | | |
| Dr. Vijay Kumar Singh | Associate Professor, Dept. of Zoology | Agra College, Agra |
| Dr. Santosh Singh | Dean, Dept. of Agriculture | Mahatma Gandhi Kashi Vidhyapeeth, Varanasi |
| Dr. Baby Tabussam | Associate Professor, Dept. of Zoology | Govt. Raza P.G. College Rampur, U.P. |
| Dr. Sanjay Jain | Associate Professor, Dept. of Statistics | St. John's College, Agra |

Syllabus Developed by:

| S.No. | Name | Designation | Department | College/University |
|-------|-------------------------|---------------------|----------------------------------|--|
| 1. | Prof. Ashutosh Gupta | Director/Professor | School of Science | U.P.Rajarshi Tandon Open University, Prayagraj |
| 2. | Prof. Manu Pratap Singh | Professor | Computer Science | Dr. B. R. Ambedkar University, Agra |
| 3. | Dr. Brajesh Kumar | Associate Professor | Computer Science and Info. Tech. | MJP Rohilkhand University, Bareilly |

**Year wise Structure
of
B.Sc. (Computer Science)**

| | |
|---|--|
| Subject prerequisites | |
| To study the Computer Science, a student must have had the subject(s) computer science OR Mathematics in class/12 th . | |
| Programme outcomes (POs): Students taking admission to B.Sc. program are expected to get prepared with following outcomes: | |
| PO 1 | Explaining the basic scientific principles and methods. |
| PO 2 | Inculcating scientific thinking and awareness among the student. |
| Programme specific outcomes (PSOs) | |
| PEO 1 | To prepare students for career in computer science and its applications in professional career |
| PEO 2 | To develop the student to cope up with the advancements in respective science field |
| PEO 3 | The student will determine the appropriate level of technology for use in: a) experimental design and implementation, b) analysis of experimental data, and c) Numerical and mathematical methods in problem solutions. |
| PEO 4 | Investigate and apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods |

| Year wise Structure of B.Sc. for subject Computer Science | | | | | | | | | | | |
|---|---------------------------|------|--|--------|-----------------------------|---|--|--------|---------------------|--------|------------------------------|
| Type of Award | Subject: Computer Science | | | | | | | | | | Total Credits of the subject |
| | Year | Sem. | Paper 1 Theory | credit | Paper 2 Theory | | Paper 3 Practical | credit | Research Project | credit | |
| Certificate in Computer | 1 | I | Problem Solving using Computer | 4 | -- | | Software Lab using Python | 2 | Nil | Nil | 6 |
| | | II | Database Management Systems | 4 | -- | | Database Management Systems Lab | 2 | Nil | Nil | 6 |
| Diploma in Computer | 2 | III | Operating Systems | 4 | -- | | Operating Systems Lab | 2 | Nil | Nil | 6 |
| | | IV | Computer System Architecture | 4 | -- | | Computer System Architecture Lab | 2 | Nil | Nil | 6 |
| Bachelor of Science | 3 | V | Analysis of Algorithms and Data Structures | 4 | Soft Computing | 4 | Lab on Algorithms and Data Structures with C++ | 2 | Research Project-I | 3 | 13 |
| | | VI | Data Communication and Computer Networks | 4 | Cyber Security & Cyber Laws | 4 | Lab on Computer Networks | 2 | Research Project-II | 3 | 13 |
| Total Credits: | | | | | | | | | | | 50 |

| Practical Evaluation & Assessment | | | |
|-----------------------------------|-----------|-------------------------|-----------|
| Internal Assessment | Marks | External Assessment | Marks |
| Class Interaction | 05 | Viva Voce | 25 |
| Quiz 1 | 10 | Execution/Demonstration | 20 |
| Quiz 2 | 10 | Write up/theory work | 20 |
| | | Practical Record File | 10 |
| | 25 | | 75 |

Syllabus for B.Sc.: Subject: Computer Science

| Programme/Class: Certificate | Year: First | Semester: First |
|--|---|------------------------|
| Subject: Computer Science | | |
| Course Code: B070101T | Course Title: Problem Solving using Computer | |
| <p>Course outcomes:</p> <p>CO 1: Understand hardware components of computer system such as memory system organization, input/output devices, aware of software components of computer system, and windows operating system concepts.</p> <p>CO 2: Develops basic understanding of computers, the concept of algorithm and algorithmic thinking.</p> <p>CO3: Develops the ability to analyze a problem, develop an algorithm to solve it.</p> <p>CO4: Develops the use of the Python programming language to implement various algorithms, and develops the basic concepts and terminology of programming in general.</p> <p>CO5: Introduces the more advanced features of the Python language</p> | | |
| Credits: 4 | Core Compulsory | |
| Max. Marks: 25+75 | Min. Passing Marks: | |
| Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0 | | |
| Unit | Topic | No. of Lectures |
| I | Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers. | 7 |
| II | Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices. Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. | 8 |
| III | Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. | 7 |
| IV | Overview of Programming: Structure of a Python Program, Elements of Python, IDEs for python, Python Interpreter, Using Python as calculator, Python shell, Indentation. | 8 |
| V | Introduction to Python: Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator). | 8 |

| | | |
|-------------|--|---|
| VI | Creating Python Programs: Input and Output Statements, Control statements (Looping- while Loop, for Loop, Loop Control, Conditional Statement- if...else, Difference between break, continue and pass). | 7 |
| VII | Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments. File handling in python. | 7 |
| VIII | Introduction to Advanced Python: Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming. Basic concepts of concepts of Package and modules | 8 |

Suggested Readings:

1. P. K. Sinha & Priti Sinha , “Computer Fundamentals”, BPB Publications, 2007.
2. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
3. T. Budd, Exploring Python, TMH, 1st Ed, 2011
4. Python Tutorial/Documentation www.python.org 2010
5. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
6. Rober Sedgewick, K Wayne -Introduction to Programming in Python: An interdisciplinary Approach" Pearson India

Suggestive digital platforms web links-

<https://www.pearsoned.co.in/prc/book/anita-goel-computer-fundamentals-1e-1/9788131733097>

<http://docs.python.org/3/tutorial/index.html>

<http://interactivepython.org/courselib/static/pythonds>

<http://www.ibiblio.org/g2swap/byteofpython/read/>

This course can be opted as an elective by the students of following subjects:

“Skill Based Elective”

“Elective”

Suggested Continuous Evaluation Methods: **Max. Marks: 25**

1. Assessment Type: Class Tests (Max. Marks 14)

Suggested Usage:

Include all types of questions-essay, short answer, objective; Design to test all levels of domain; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions and proper sampling of content; Marking Criteria made known to students; Teacher should provide written feedback selectively and discuss answers in the class; Only Role/Code numbers, not names be written to avoid bias in marking; Display of model answer copies.

After Completion of Unit I and Unit II, a first class test of max. marks of 7 shall be conducted.

After Completion of Unit III and IV, a second class test of max. marks of 7 shall be conducted.

If any student does not appear in any one or both class test, a makeup test shall be conducted of max. marks of 5 instead of total 14 marks.

- 2. Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False; Matching; Classifying) /Recall Type -Filling Blanks; One word / Phrase Answers (Max Marks: 5)**

Suggested Usage: Teachers be trained in construction, advantages, disadvantages and precautions while preparing different types of objective items; Go beyond factual information to High Order Thinking (HOT) Skills. It shall be “End of the class quiz”.

- 3. Assessment Type: Assignments (Max Marks: 4)**

Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge.

- 4. Assessment Type: Class Interaction (Max. marks: 2)**

Course prerequisites: None

Suggested equivalent online courses:

Further Suggestions:
None

| | | |
|--|--|------------------------|
| Programme/Class: Certificate | Year: First | Semester: First |
| Subject: Computer Science | | |
| Course Code: B070102P | Course Title: Software Lab using Python | |
| Course outcomes: | | |
| <ol style="list-style-type: none"> 1. To learn and understand Python programming basics. 2. To learn and understand python looping, control statements and string manipulations. 3. Students should be made familiar with the concepts of GUI controls and designing GUI applications. 4. To learn and know the concepts of file handling, exception handling and database connectivity. | | |
| Credits: 2 | Max. Marks: 25+75 | Min. Passing Marks: |
| Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-4 | | |
| Suggested Readings: | | |
| <ol style="list-style-type: none"> 1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/thinkpython/) 2. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011. 3. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition, 2013. 4. John V Guttag, "Introduction to Computation and Programming Using Python", Revised and expanded Edition, MIT Press , 2013 5. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012. | | |

Section: A (Simple programs)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
 - Grade A: Percentage ≥ 80
 - Grade B: Percentage ≥ 70 and < 80
 - Grade C: Percentage ≥ 60 and < 70
 - Grade D: Percentage ≥ 40 and < 60
 - Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$

7. WAP to calculate the sum and product of two compatible matrices.

Section: B (Visual Python)

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3D objects
 - I. curve
 - II. sphere
 - III. cone
 - IV. arrow
 - V. ring
 - VI. Cylinder.
2. WAP to read n integers and display them as a histogram.
3. WAP to display sine, cosine, polynomial and exponential curves.
4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.
6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:
$$P(t) = (15000(1+t))/(15 + e^t)$$
where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
7. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
 - I. velocity wrt time ($v=u+at$)
 - II. distance wrt time ($s=u*t+0.5*a*t*t$)
 - III. distance wrt velocity ($s=(v*v-u*u)/2*a$)

Note: The instructors should design detailed experiments based on above suggested experiments. Instructor / Concern faculty may include or exclude the programs from the list of given programs.

| Programme/Class: Certificate | Year: First | Semester: Second |
|--|---|-------------------------|
| Subject: Computer Science | | |
| Course Code: B070201T | Course Title: Database Management System | |
| Course outcomes: | | |
| After the completion of the course the students will be able to: | | |
| <ol style="list-style-type: none"> 1. Understands the basic concepts of data base management systems. 2. Design E-R diagrams for real world applications. 3. Formulate relational algebraic expressions using relational data models and languages. 4. Apply normalization transaction properties and concurrency control to design database. 5. Analyze the security algorithms for database protection. | | |
| Credits: 4 | Core Compulsory | |
| Max. Marks: 25+75 | Min. Passing Marks: | |
| Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0 | | |
| Unit | Topic | No. of Lectures |
| I | Introduction: Database System Concepts, File system vs. database system, Database system architecture, Data models and their types, Data base scheme and instances, Data independence, Database Languages and Interfaces. | 7 |
| II | Data Modeling Concepts ER model concepts: Notations for ER diagram, Extended E-R diagram, Extended E-R model, E-R model design issues, constraints, and keys: Weak entity set strong entity set, Relationships of higher degree. | 8 |
| III | Relational model concepts: code rules, constraints, Relational Algebra operations, Extended relational algebra operations, Relational Calculus, Tuple and Domain relational calculus. | 7 |
| IV | Database Design Functional dependencies, Normal forms, First, second, and third normal forms, BCNF, Multi-valued dependencies and Fourth Normal form, Join Dependencies and Fifth Normal form. | 8 |
| V | Transaction, Query Processing Transaction and system concepts: transaction states, ACID properties of transactions, concurrent execution schedules and Recoverability, Serializability of schedules. Query Processing and Optimization: Measures of Query cost, Cost, Evaluation of expression. Optimization: Transformation of relational expression, Choice of evaluation plan. | 7 |
| VI | Concurrency Control: Concurrency Control Techniques: Two phase Locking Techniques for Concurrency Control; Time stamping in Concurrency control. | 8 |
| VII | Introduction to SQL Basic Structure of SQL Query, Set operators, SELECT, UNION, INTERSECT, and EXCEPT, Nested queries, Aggregate function, Null values, Derived Relations, Modification of the Database, Joined relations and up-dates in SQL. | 8 |
| VIII | Database Security | |

| | | |
|--|---|---|
| | Importance of data, Threats and risks, Users and database privileges, Access Control, Security for Internet Applications, Role of Database Administrator. | 7 |
| <p>Suggested Readings:</p> <ol style="list-style-type: none"> 1. Henry F. Korth and Abraham Silberschatz, "Database System Concepts," Second Edition, McGraw Hill, 1991. 2. AtulKahate, "Introduction to Database Management Systems," Pearson India, 2004. 3. Raghu Ramakrishnan and Johannes Gehrike, "Database Management Systems," Third McGraw Hill, Edition, 2003. 4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6 Edition, Pearson Education,2013. 5. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010. 6. C.J Date " An Introduction to Database Systems", Addison Wesley | | |
| <p>This course can be opted as an elective by the students of following subjects: B. Sc in Engineering and BCA</p> | | |
| <p>Suggested Continuous Evaluation Methods:</p> <ol style="list-style-type: none"> 1. Assessment Type: Class Tests (Max. Marks 14) Suggested Usage: Include all types of questions-essay, short answer, objective; Design to test all levels of domain; Exam Blue Print be prepared to ensure inclusion of all types & levels of questions and proper sampling of content; Marking Criteria made known to students; Teacher should provide written feedback selectively and discuss answers in the class; Only Role/Code numbers , not names be written to avoid bias in marking; Display of model answer copies. After Completion of Unit I and Unit II, a first class test of max. marks of 7 shall be conducted. After Completion of Unit III and IV, a second class test of max. marks of 7 shall be conducted. If any student does not appear in any one or both class test, a makeup test shall be conducted of max. marks of 5 instead of total 14 marks. 2. Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False; Matching; Classifying) /Recall Type -Filling Blanks; One word / Phrase Answers (Max Marks: 5) Suggested Usage: Teachers be trained in construction, advantages, disadvantages and precautions while preparing different types of objective items; Go beyond factual information to High Order Thinking (HOT) Skills. It shall be “End of the class quiz”. 3. Assessment Type: Assignments (Max Marks: 4) Suggested Usage: Some class assignments shall be given to students at the end of each Unit. Note making techniques be taught to students; Not just direct questions from notes, but application analysis and synthesis of that knowledge. 4. Assessment Type: Class Interaction (Max. marks: 2) | | |

Course prerequisites: To study this course, a student must have had the subject Mathematics in class 12th and Problem solving using computers in first semester.

Suggested equivalent online courses:

Further Suggestions:

| | | |
|--|---|-------------------------|
| Programme/Class: Certificate | Year: First | Semester: Second |
| Subject: Computer Science | | |
| Course Code: B070202P | Course Title: Database Management Systems Lab | |
| Course outcomes: | | |
| Ability to: | | |
| <ol style="list-style-type: none"> 1. Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations. 2. Design and implement a database schema for a given problem. 3. Do connectivity of PHP and MySQL to develop applications. | | |
| Credits: 2 | Max. Marks: 25+75 | Min. Passing Marks: |
| Total No. of Lectures-Tutorials-Practical (in hours per week): 0-0-4 | | |
| Suggested Readings: | | |
| <ol style="list-style-type: none"> 1. Paul DuBois, "MySQL Cookbook: Solutions for Database Developers and Administrators," Third Edition, O'Reilly Media, 2014. 2. Frank M. Kromann, "Beginning PHP and MySQL: From Novice to Professional," Fifth Edition, Apress, 2018. 3. Joel Murach and Ray Harris, "Murach's PHP and MySQL," First Edition, Mike Murach & Associates, 2010. 4. Luke Welling, Laura Thomson, "PHP and MySQL Web Development," Fourth Edition, Addison-Wesley, 2008. | | |

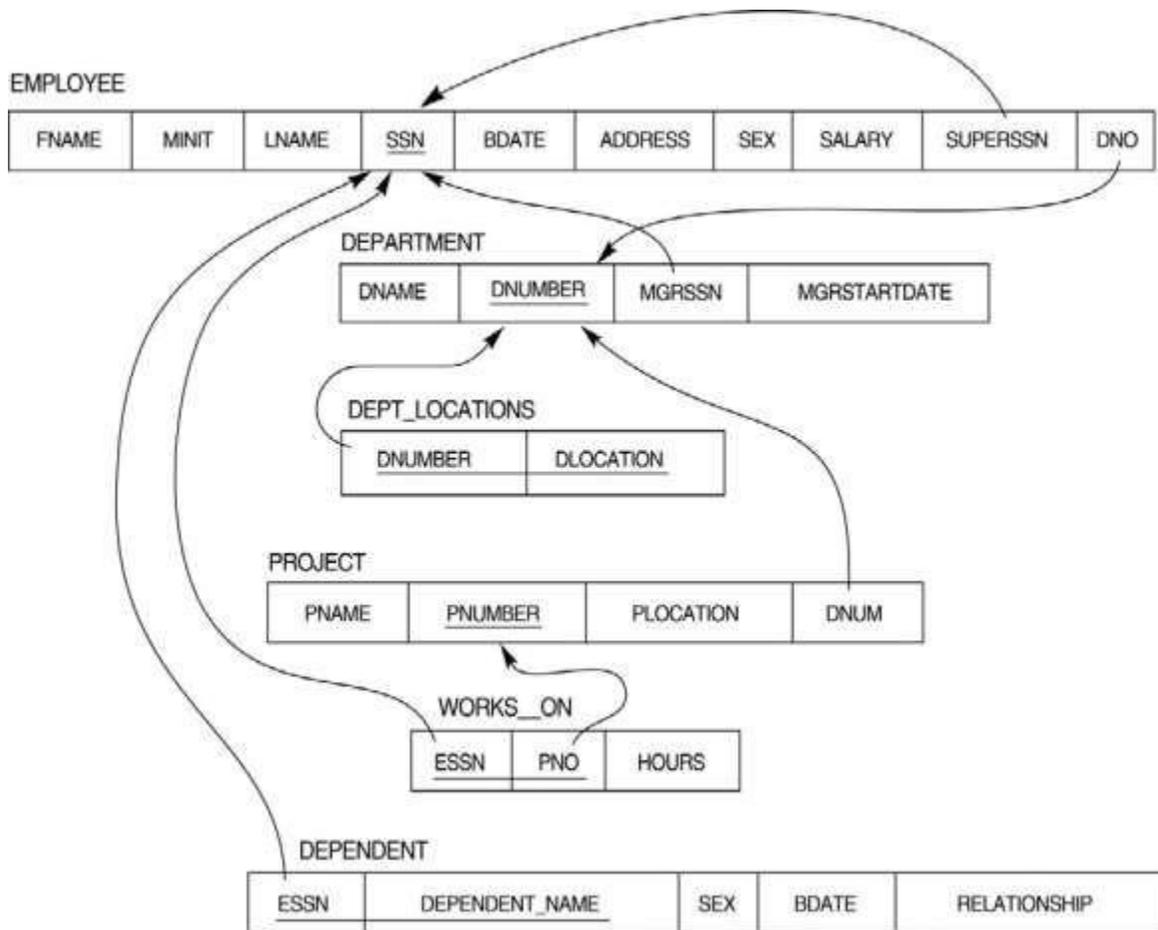
Software Lab based on Database Management Systems

Note: PHP/MySQL may be used

List of Experiments

1. Creation of databases and execution of SQL queries.
2. Creation of Tables using MySQL: Data types, Creating Tables (along with Primary and Foreign keys), Altering Tables and Dropping Tables.
3. Practicing DML commands- Insert, Select, Update, Delete.
4. Practicing Queries using ANY, ALL, IN, EXISTS, NOT, EXISTS, UNION, INTERSECT, and CONSTRAINTS, etc.
5. Practice Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, VIEWS Creation and Dropping.
6. Use of COMMIT, ROLLBACK and SAVEPOINT.
7. Practicing on Triggers - creation of trigger, Insertion using trigger, Deletion using trigger, Updating using trigger.
8. To remove the redundancies and anomalies in the above relational tables, Normalize up to Third Normal Form.

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create tables with relevant foreign key constraints
2. Populate the tables with data
3. Perform the following queries on the database :
 1. Display all the details of all employees working in the company.
 2. Display ssn, lname, fname, address of employees who work in department no 7.
 3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'
 4. Retrieve the name and salary of every employee
 5. Retrieve all distinct salary values
 6. Retrieve all employee names whose address is in 'Bellaire'

7. Retrieve all employees who were born during the 1950s
8. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
9. Retrieve the names of all employees who do not have supervisors
10. Retrieve SSN and department name for all employees
11. Retrieve the name and address of all employees who work for the 'Research' department
12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.
13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
14. Retrieve all combinations of Employee Name and Department Name
15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
18. Select the names of employees whose salary does not match with salary of any employee in department 10.
19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.
20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
21. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
22. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
23. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
24. For each department, retrieve the department number, the number of employees in the department, and their average salary.
25. For each project, retrieve the project number, the project name, and the number of employees who work on that project.

26. Change the location and controlling department number for all projects having more than 5 employees to 'Bellaire' and 6 respectively.
27. For each department having more than 10 employees, retrieve the department no, no of employees drawing more than 40,000 as salary.
28. Insert a record in Project table which violates referential integrity constraint with respect to Department number. Now remove the violation by making necessary insertion in the Department table.
29. Delete all dependents of employee whose ssn is '123456789'.
30. Delete an employee from Employee table with ssn = '12345'(make sure that this employee has some dependents, is working on some project, is a manager of some department and is supervising some employees). Check and display the cascading effect on Dependent and Works on table. In Department table MGRSSN should be set to default value and in Employee table SUPERSSN should be set to NULL
31. Perform a query using alter command to drop/add field and a constraint in Employee table.

Note: The instructors should design detailed experiments based on above suggested experiments. Instructor / Concern faculty may include or exclude the programs from the list of given programs.