B.A./B.Sc(Computer Application)

Common minimum syllabus for all U.P state university

Proposal syllabus based on NEP- 2020

Types of Award	Year	Sem.	Paper I (TH)	Credit	PaperII (TH)	Credit	Paper III (pr.)	Credit	Research/ project	Credit	Total credit of subject
Certificate in computer application	1	I	Computer-fundamental with problem solving using Python	4	-	-	Software lab using python	2	-	-	6
		II	Database management system	4	-	-	DBMS Lab	2	-	-	6
Diploma in computer application	2	III	C Programming With Data-Structure	4	-	-	Lab on C with D.S.	2	-	-	6
		IVth	Operating System	4	-	-	O.S lab UNIX commands	2	-	-	6
Bachelor of Science	3	Vth	Java Programming	4	Introduction to Data Science and Machine Learning	4	Lab on java	2	Project	3	13
		VIth	DataCommunication and Computer Network	4	Web Technology	4	Lab on web tech	2	Project	3	13

Total= 50

Practical Evaluation and Assessment

Internal assesment	Marks	External assesment	Marks
Class 1	05	Viva voice	25
Quiz 1	10	Execution/demonstration	20
Quiz 2	10	Write up/ thery work	20
	25	Practicle record file	10
			75

B.Sc.-I (COMPUTER APPLICATION)
PAPER- I(TH.)
Course Title: Computer Fundamental with Problem Solving using Python

Programme/Class: Certificate	Year: **First**	Semester:**First**

Subject: Computer Application	
	Course Title: **Computer Fundamental with Problem Solving using Python**

Course outcomes:

After the completion of the course the students will be able:

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.
2. Develops basic understanding of computers, the concept of algorithm and algorithmic thinking.
3. To learn and understand basics related computer fundamentals.
4. To learn and understand Python Programming looping, control statements and string manipulations.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Unit	Topic
I	Introduction to Computer and Problem Solving-Information and Data Hardware-CPU, Primary and Secondary storage, I/O devices, . Problem Solving- Algorithm, Flow charts, Decision tables & Pseudo codes.
II	Number systems and Codes- Number representation- weighted codes, Non-weighted codes, Position, Binary, Octal, Hexadecimal, Binary Coded Decimal (BCD), Conversion of bases, Boolean algebra- Fundamentals of Boolean algebra, Switches and inverters, Functionally Complete Gates (AND, OR, NOT), NAND, NOR, switching function and Boolean function, De Morgan's Theorem, Application of Boolean Algebra, Algebraic & K-map
III	**Overview of Programming**: Structure of a Python Program, Elements of Python, IDEs for python, Python Interpreter, Using Python as Calculator, Python shell, Indentation. 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).
IV	**Creating Python Programs:** Input and Output Statements, Control statements (Looping- while Loop, for Loop, Loop Control,ConditionalStatement-if...else, Difference between break, continue and pass). **Structures**: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.

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.or 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

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 Answer**(Max Marks: 5)

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)

B.Sc.-I (COMPUTER APPLICATION)
PAPER- II(PR.)

Course Title: Software Lab using Python

Programme/Class: **Certificate**	Year: **First**	Semester:**Fisrt**
Subject: Computer Application		
Course Code:	Course Title: **Software** Lab using Python	

Suggest Books:
1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.or 2010
3. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available

Credits**: 2**	Max. Marks: **25+75**	Min. Passing Marks:

Course outcomes:

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.

To learn and know the concepts of file handling, exception handling and database connectivity.

Lab Work on Python

(Simple programs)

1. Write a program to convert the given temperature from Celsius to Fahrenheit 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 >=90 Grade B: Percentage>80 and <90 Grade C: Percentage>=70 and <80 Grade D: Percentage>60 and <70 Grade E: Percentage<60
3. WAP to display the first n terms of Fibonacci series.
4. WAP to find factorial of the given number.
5. WAP to find sum of natural no of Nth term:
6. WAP to Check input No is prime no or Not.
7. WAP to print ASCII value of a character
8. WAP to find largest no in a list.
9. WAP swap two no in a list.
10. WAP print odd and even no in a list.

Programme/Class: Certificate	Year: **First**	Semester:**Second**
Subject: Computer Application		
	Course Title: **Database Management System**	

Course outcomes:

After the completion of the course the students will be able to:
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:

Unit	Topic
I	Introduction to databases-Database and its Hierarchies, History of Databases, Types of DBMS, Database Architecture, Three layered Architectural I/O Functions, Relational Model – Logic Data models, Relational Data Model, Querying Relational Data Model, Relational Algebra, and Relational Calculus.
II	SQL – SQL Language, SQL Database object, SQL Data Types, DDL, DML, and DCL commands, Deleting data, Retrieving Data, Insertion of Data, Updating Data , Integrity constraint ,Keys, Creating and altering tables ,and Views,.
III	E-R Modeling, Normalization-Database Design, Entity ,Attributes, and Entity sets, Relationship and Relation sets, ER Diagram, Features of ER Diagram,. Database Security – Access Control.
IV	Data warehousing Definition, DBMS vs Data Warehouse Data marts , Metadata Multidimensional Data Mode , Data Cubes, Schemas.

Suggested Readings:
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. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition

Suggested Readings:

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. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition

4. 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.

3 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".

5. 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.

6. Assessment Type: Class Interaction (Max. marks: 2)

B.Sc.-I (COMPUTER APPLICATION)
## PAPER- II(PR.)

Course Title:DBMS Lab

1

Programme/Class: **Certificate**	Year: **First**	Semester:**Second**
Subject: Computer Application		
Course Code:	Course Title: **DBMS** Lab using MySQL	

Suggest Books:
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.

Credits: **2**	Max. Marks: **25+75**	Min. Passing Marks:

Course outcomes:

Ability to:
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. Do connectivity of PHP and MySQL to develop applications.

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.
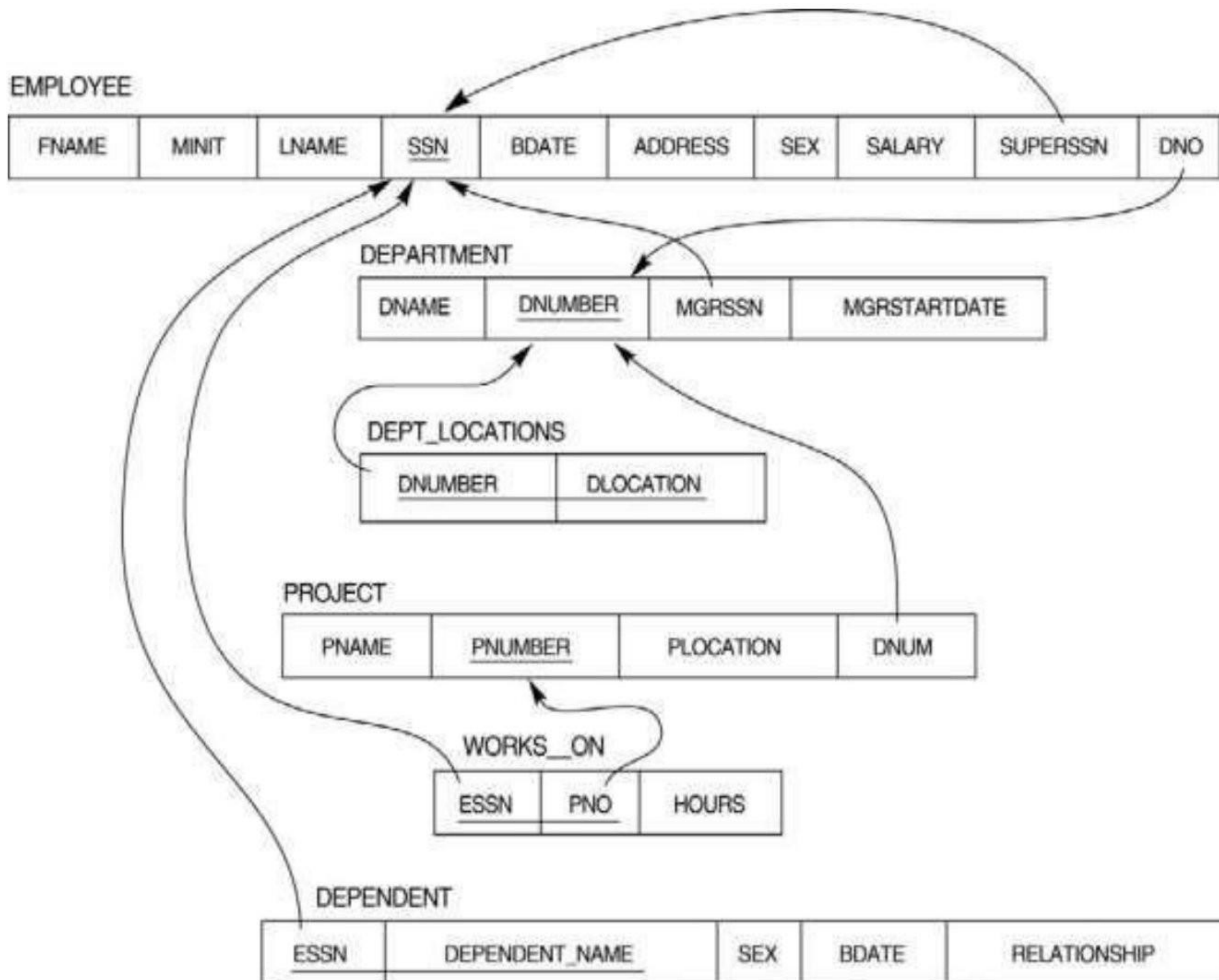
Questions to be performed on above schema

1. Create tables with relevant foreign key constraints

2. Populate the tables with data

3. Perform the following queries on the database :

   i. Display all the details of all employees working in the company.

   ii. Display ssn, lname, fname, address of employees who work in department no 7.

   iii. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'

   iv. Retrieve the name and salary of every employee

   v. Retrieve all distinct salary values

   vi. Retrieve all employee names whose address is in 'Bellaire'

   vii. Retrieve all employees who were born during the 1950s

   viii. Retrieve the names of all employees who do not have supervisors

ix. Retrieve SSN and department name for all employees.

x. Retrieve the name and address of all employees who work for the 'Research' department

xi. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.

xii. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor,

xiii. Retrieve all combinations of Employee Name and Department Name.

xiv. 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.

xv. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.

xvi. 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.

xvii. Select the names of employees whose salary does not match with salary of any employee in department 10.

B.Sc.-II (COMPUTER APPLICATION)
PAPER- I(TH.)
Course Title: C Programming with Data-Structure

Programme/Class: Diploma	Year: **Second**	Semester:**Third**
Subject: Computer Application		
	Course Title: **C Programming With Data-Structure Lab**	

Course outcomes:

After the completion of the course the students will be able:
1. To learn and understand C programming basics.
2. To learn and understand C looping, control statements and string manipulations.
3. To learn and understsand data structure concept.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Unit	Topic
I	C Fundamentals- Character set, Identifiers and keywords, Data Types, Constants, Variables and Arrays, Declarations, Operators & Expressions, Library functions, Statements, Symbolic Constants, Preprocessor directives Data Input and Output- getchar(), putchar(), scanf(), printf(), gets(), puts() functions Control Statements- if-else, while, do-while, goto , for statements, nested control structures, switch, break, continue statements, comma operator.
II	Functions- Function prototypes, Passing arguments to a function by value, Recursion, Storage classes, Automatic, External, Static, Register variables. Arrays- Definition, Processing arrays, Passing arrays to functions, Introduction to multidimensional arrays, arrays and strings Pointers- declaration, referencing and de-referencing, passing pointers to functions, pointer to arrays, operations of files using pointers Structures and Unions.
III	Data Structure- Definition and abstract data types, Stacks- definition, Array based implementation of stacks, Linked list, infix, prefix, postfix representation, Conversions, Applications. Queues , Dqueues and its implementation using C, Trees: Definition of trees and Binary trees ,Graphs & Sorting Algorithms - Graphs- Definition of Undirected and Directed graphs Graph Traversal – Breadth first Traversal, Depth First Traversal, Array based implementation using C.
IV	Sorting Algorithm- Introduction of Sorting, Sorting by Exchange, Selection, Insertion- Bubble sort, Merge and Quick Sort Algorithm

Suggested Readings:

1. Let Us C by Yashwant Kanitkar BPB
2. Data Structure Using C by A.M , LPE
3. Data Programming in C by Schaum Series
4. Structure and Program by Jr. Symour Lipschetz , Schaum's outline by TMH

---

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)

B.Sc.-II (COMPUTER APPLICATION)
PAPER- II(PR.)
Course Title: C Programming with Data-Structure

Programme/Class: **Diploma**	Year: **Second**	Semester:**Third**
Subject: **Computer Application**		
Course Code:	Course Title **C Programming with DS Lab**	

Course outcomes:

Ability to:
1. To learn and understand C programming basics.
2. To learn and understand C looping, control statements and string manipulations.
3. To learn and understsand data structure concept like stack ,queue,tree,graph

Credits**: 2**	Max. Marks: **25+75**	Min. Passing Marks:

Suggested Readings:
1. Let Us C by Yashwant Kanitkar BPB
2. C in depth S.K. Srivastava and Deepali Srivastava.
3. Data Structure Using C by A.M , LPE
4. Data Programming in C by Schaum Series

Lab Work on C with DataStructure

Note: Following exercises can be performed using Turboc –C

1. Write a program to calculate the area of circle?
2. Write a program to input a given number find the even or odd number?
3. Write a program in C to calculate frequency of given no in array of size 10.
4. Write a program to find the minimum and maximum number in an array of size 10.
5. Write a program in C to print the series of prime no upto given range.

(ex :- enter the range of prime no =5 output -prime no are 2,3,5,7,11)

6. Write a program C input 10 element in array find sum of element.

7. Write a program in C input 10 element in array and print in ascending order using sorting methods.(Bubble/Selection Sort)

8. Write a program in C input 2-D array and display in Matix form.

9. Write a program in C input 2-D array find sum of diagonals.

10.Write a program in C input any string and find length of string without using strlen () function.

11. Write a program in C input any string check input string is Palin or Not?

12. Write a program in C input two string check if two strings match where one string contains wildcard characters.

13. Write a program in C input 5 Students details like RollNo,Name ,Marks and display student record enter by rollno using structure.

14. Implementation Push and Pop function in Stack using array.

15. Implementation Insert and Delete function in Queue using array.

B.Sc.-II (COMPUTER APPLICATION)
PAPER- I(TH.)
Course Title: Operating System

Programme/Class: Diploma	Year: **Second**	Semester: **Fourth**
Subject: Computer Application		
	Course Title: **Operating System**	

Course outcomes:

After the completion of the course the students will be able:
1. Understand role, responsibilities, features, and design of operating system.
2. Analyze memory management schemes and process scheduling algorithms.
3. Apply process synchronization techniques to formulate solution for critical section problems.
4. Illustrate concept of disk scheduling.
5. Evaluate process deadlock handling techniques.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Unit	Topic
I	**Introduction** Operating system and functions, Classification of Operating systems: Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multithreaded Systems, Operating System Structure, System Components, Operating System Services, Kernels, Monolithic and Microkernel Systems.
II	**Process Management:** Process Concept, Process States, Process Synchronization, Critical Section, Mutual Exclusion, Classical Synchronization Problems, Process Scheduling, Process States, Process Transitions, Scheduling Algorithms Interprocess Communication, Threads and their management, Security Issues.
III	**CPU Scheduling:** Scheduling Concepts, Techniques of Scheduling, Preemptive and Non- Preemptive Scheduling: First-Come-First-Serve, Shortest Request Next, Highest Response Ration Next, Round Robin, Least Complete Next, Shortest Time to Go, Long, Medium, Short Scheduling, Priority Scheduling. Deadlock: System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.
IV	**Memory Management:** Memory allocation, Relocation, Protection, Sharing, Paging, Segmentation,VirtualMemory,Demand Paging, Page Replacement Algorithms, Thrashing I/O Management and Disk Scheduling **I/O devices, and I/O subsystems, I/O buffering,** Disk storage and disk scheduling, RAID.

Suggested Readings:

1. Andrew S. Tanenbaum and Herbert Bos,"Modern Operating Systems," Fourth Edition, Pearson, 2014.
2. Abraham Silberschatz, Greg Gagne, and Peter B. Galvin, "Operating System Concepts," Tenth Edition, Wiley, 2018.
3. William Stallings, "Operating Systems: Internals and Design Principles," Seventh Edition, Prentice Hall, 2011.
4. Dhanjay Dhamdhere, "Operating Systems," First Edition, McGraw-Hill, 2008
5. Milan Milankovic "Operating systems, Concepts and Design" McGraw Hill

Suggested Continuous Evaluation Methods:

    2.   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.

    3   Assessment Type: Quizzes/ Objective Tests / Recognition Type (such as MCQs; True or False; Matching; Classifying) /Recall Type -Filling Blanks; One word / Phrase

B.Sc.-II (COMPUTER APPLICATION)
PAPER- II(PR.)
Course Title: Operating System Lab

Programme/Class: **Diploma**	Year: **Second**	Semester: **Fourth**
Subject: Computer Application	
Course Code:	Course Title: **Operating Systems Lab**	

Course outcomes:
Ability to:
1. Use of Linux operating system and able to write shellprograms.
2. Simulate and demonstrate the concepts of operatingsystems.

Credits: **2**	Max. Marks: **25+75**	Min. Passing Marks:

Suggested Readings:
1. Sumitabh Das, "Your Unix/Linux: The Ultimate Guide," McGraw Hill,2012.
2. Richard Blum and Christine Bresnahan, "Linux Command Line and Shell Scripting Bible," Wiley,2015.
3. Dhanjay Dhamdhere, "Operating Systems," First Edition, McGraw-Hill,2008
4. Milan Milankovic "Operating systems, Concepts and Design" McGrawHill

Lab on Operating Systems

Note: Following exercises can be performed using Linux or Unix

1. Usage of following commands:
2. ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch,cd.
   Usage of following commands:
   cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage offollowingcommands: chmod, grep, tput (clear,highlight),bc.

4. Write a shell script to check if the number entered at the command line is primeornot.
5. Write a shell script to modify "cal" command to displaycalendars of the specifiedmonths.
6. Write a shell script to modify "cal" command to displaycalendars of the specified range ofmonths.
7. Write a shell script to accept a login name. If not a valid loginname display message – "Entered login name isinvalid".
8. Write a shell script to display date in the mm/dd/yyformat.
9. Write a shell script to display on the screen sorted output of"who" command along with the total number of users.
10. Write a shell script to display the multiplication table anynumber,
11. Write a shell script to compare two files and if found equal asks the user to delete theduplicate file.
12. Write a shell script to check whether the file have all the permissions ornot.

B.Sc.-III (COMPUTER APPLICATION)
PAPER- I(TH.)

Course Title:Java Programming

Programme/Class: Bachelor	Year:**Third**	Semester:**Fifth**
Subject: Computer Application		
	Course Title: **Java Programming**	

Course outcomes:
After the completion of the course the students will be able:
1. To learn and understand Java programming basics.
2. To learn and understand Java looping, control statements and string manipulations.

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
I	Introduction to JAVA: JAVA Evolution: Java History, Java Features, How Java Differs from C and C++, Java and InternetOverview of JAVA Language: Introduction, Simple Java program, More of Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style. Constants, Variables, and Data Types Introduction to Operators, Arithmetic Operators, Relational Operators Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversion and Associativity, Mathematical Functions. Decision Making and Branching: Introduction, Decision Making with if Statement, Simple if Statement, The if.....else Statement, Nesting of if.........Else Statements, The else if Ladder, The Switch Statement, The ?: Operator. Decision Making and Looping: Introduction. The while Statement, The do Statement, The for Statement, Jumps in Loops Labeled Loops.
II	Classes, Arrays, Strings and Vectors: Classes, Objects and Methods: Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a Class Overriding Methods, Final Variables and Methods, Finalizer methods, Abstract Methods and Classes, Visibility Control. Arrays, Strings and Vectors: Arrays, One-dimensional Arrays, Creating an Array, Two -Dimensional Arrays, Creating an Array, Two – dimensional Arrays, Strings, Vectors, Wrapper Classes.

III	Interfaces, Packages, and Multithreaded Programming: Interfaces: Multiple Inheritance: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables. Packages: Putting Classes together: Introduction, Java API Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes. Multithreaded Programming: Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking a thread, Life Cycle of a thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface.
IV	Managing Exceptions, Applet Programming: Managing Errors and Exception: Introduction, Types of Exception Handling Code, Multiple Catch Statements, Using Finally Statement, Throwing Our Own Exceptions, Using Exceptions fo Debugging. Applet Programming: Introduction, How Applets Differ from Applications, Preparing to Write Applets, Building Applet Code, Applet Life Cycle, Creating an Executable applet,Designing a Web Page, Applet Tag, Adding Applet to HTML File, running the Applet, More About HTML Tags, Displaying Numerical Values, Getting Input from the User.

Suggested Readings:

Text Books:

1. A.Balaguruswamy, "Programming with JAVA", A Primer, TMH, 1999.

Reference Books:

1. Thomas Boutel, "CGI programming in C and Perl", Addison – Wesley, 1996.

2. Jefry Dwight et al, Using CGI, Second Edition, Prentice Hall, India, 1997.

3. Patrick Naughton & Herbert Schildt, JAVA 2: The Complete Reference, THM, 1999.

4. Schildt, "JAVA The Complete Reference", 7th Edition.

Suggested Continuous Evaluation Methods:

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)

B.Sc.-III (COMPUTER APPLICATION)
PAPER- II(PR.)

Course Title:Java Programming Lab

Programme/Class: **Diploma**	Year: **Third**	Semester:**Fifth**
Subject: Computer Application		
Course Code:	Course Title: **Java Programming** Lab	

Course outcomes:

Ability to:
1. **To learn and understand Java programming basics.**
2. **To learn and understand Java looping, control statements and string manipulations.**

Credits**: 2**	Max. Marks: **25+75**	Min. Passing Marks:

Suggested Readings:
Text Books:
1. A.Balaguruswamy, "Programming with JAVA", A Primer, TMH, 1999.
Reference Books:
1. Thomas Boutel, "CGI programming in C and Perl", Addison – Wesley, 1996.
2. Jefry Dwight et al, Using CGI, Second Edition, Prentice Hall, India, 1997.
3. Patrick Naughton & Herbert Schildt, JAVA 2: The Complete Reference, THM, 1999.
4. Schildt, "JAVA The Complete Reference", 7th Edition.

Lab Work on Java Programming

Note: Following exercises can be performed using Java

1. Write a program to calculate the area of rectangle?
2. Write a program to input two number and swap them with using third variable.
3. Write a program to input a given number find the even or odd number?
4. Write a program in java to find sum of natural number.
5. Write a program to find the minimum and maximum number in an array of size 10.
6. Write a program in java to print the series of fibonacci no upto given range.
7. Write a program to input and display data of 10 students using classes .
8. Write a program to overload area function and display the area of circle, rectangle and triangle.
9. Write a program to input the number and find the number is Armstrong or Not?
10. Write a program to sort the element of an array in ascending order.
11. Write a program to determine whether a given string is palindrome .
12. Write a program to implement threading in java
13. What is inheritance ? Write a program to implement multilevel inheritance .
14. Write a program to implement multiple inheritance using interface..
15. Write a program in java to display image using applet .

B.Sc.-III (COMPUTER APPLICATION)
PAPER- II(TH.)

Course Title: Introduction to Data Science and Machine Learning

Programme/Class: Bachelor	Year:**Third**	Semester:**Fifth**
Subject: Computer Application		
	Course Title: **Introduction to Data Science and Machine Learning**	

Course outcomes:

After the completion of the course the students will be able:
1. Student will develop relevant programming abilities..
2. Student will develop the ability to build and assess data-based models.
3. Develop an appreciation for what is involved in learning models from data.
4. Student learn, understand and practice big data analytics and machine learing approaches.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Unit	Topic
I	**Introduction** Introduction to data science – evolution of data science – evolution of data science– data science roles stages in a data science project – applications of data science in various fields – data security issues.
II	**Data collection and data pre- processing:** Data collection strategies – data pre-processing overview- data cleaning- data integration and transformation – data reduction – data discretization.
III	**Overview and Introduction to Machine Learning:** Data Science ,AI& ML, Introduction of Machine intelligence and its application, Machine learning concept, components of a learning problem, supervised, unsupervised and reinforcement lerning, inductive learning, deductive learning
IV	**foundations of machine learning**: Hypothesis Space and Inductive bias, feature selection Classification, regression linear and polynomial, logistic regression, decision tree, random forest, naive bayes, SVM.

Suggested Readings:

1. Cathy O' Neil and Rachel Schutt, "doing data science", O'reilly,2015
2. David Dietrich, Barry Heller,beibei yang, "Data science and Big data Analytics,", EMC 2013
3. Tom M. Mitchell, "Machine learning", Mcgraw-hill Education (India) private limited
4. Stephen Marsland, "Machine learning: an Algorithmic perspective",CRC Press

Suggested Continuous Evaluation Methods:

2. 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.

3   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:

B.Sc.-III (COMPUTER APPLICATION)
PAPER- I(TH.)

Course Title: Data Comunication and Computer Network(DCCN)

Programme/Class: Bachelor	Year:**Third**	Semester:**Six**
Subject: Computer Application		
	Course Title: **Data Comunication and Computer Network(DCCN)**	

Course outcomes:

After the completion of the course the students will be able:

1. Students should be understand and explore thebasics of computer networks and various protocols

2. students will be in position to administrata a network and flow of information further He/She can understand easily the conceps of network security,mobile and ad hoc networks.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Unit	Topic
I	Introduction, Data communications, Components, Data representation(ASCII, ISO etc.), Direction of data flow(Simplex, Half duplex, Full duplex), Networks-Distributed Processing, Network Criteria, Physical structure(type of connection, topology), Types of network.
II	**A**nalog & Digital Transmission, Modulation, Need for Modulation, Modulation Techniques. Transmission media- Twisted pair cable, coaxial cable, fiber optic cable, Microwave and Satellite Communication. Switching and Switching Techniques.
III	Reference Models- OSI and TCP/IP Reference Models. Network Devices-Repeaters, Hubs, Bridges, Switches, Router, Gateway. Multiplexing- TDM, FDM, CDM.
IV	Modern Topics-ISDN services & ATM, Wireless LAN-IEE 802.11, Bluetooth, Cellular Mobile Systems, Difference between wireless and fixed telephone networks.

Suggested Readings:

1. B.A. Forouzan- Data Communications and networking (3rd Ed.)-TMH
2. W. Stallings- Data Computer Communications (5th Ed.)- PHI
3. Wireless Communications: Theodore S. Rappaport, Pearsons

Suggested Continuous Evaluation Methods:

3. 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.

4 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".

5. 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.

6. Assessment Type: Class Interaction (Max. marks: 2)

B.Sc.-III (COMPUTER APPLICATION)
PAPER- II(TH.)

Course Title: Web Technology

Programme/Class: Bachelor	Year:**Third**	Semester:Six
Subject: Computer Application		
	Course Title: **Web Technology**	

Course outcomes:

After the completion of the course the students will be able:
1. Flexible learnig opportunities
2. Interactive learning
3. Improve Overall learning experience.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:

Unit	Topic
I	**Introduction to HTML** :What is HTML HTML DocumentsBasic structure of an HTML documentCreating an HTML documentMark up Tags Heading-Paragraphs Line Breaks HTML Tags.
II	**Elements of HTML:** Introduction to elements of HTML Working with Text Working with Lists, Tables and Frames Working with Hyperlinks, Images and Multimedia Working with Forms and controls.
III	**Introduction to Cascading Style Sheets** Concept of CSS ,Creating Style Sheet, CSS Properties CSS Styling(Background, Text Format, Controlling Fonts) CSS Color Creating page Layout and Site Designs.
IV	**Introduction to Web Publishing** :Creating the Web Site Saving the site Working on the web siteCreating web site structure Creating Titles for web pages

Suggested Readings:
1. HTML 5 in simple steps -Dreamtech Press
2. A beginner's guide to HTML NCSA,14th May,2003
3. Creating a Web Page and Web Site College,2002

Reference Books:

Beginning CSS: Cascading Style Sheets for Web Design Wiley India

4. **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.

5 **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".

4. 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.

5. Assessment Type: Class Interaction (Max. marks: 2)

B.Sc.-III (COMPUTER APPLICATION)
PAPER- III(PR.)

Course Title: Web-Technology Lab

Programme/Class: **Diploma**	Year: **Third**	Semester:**Six**
Subject: Computer Application		
Course Code:	Course Title: **Web Technology Lab**	

Course outcomes:

Ability to:
1. **Flexible learnig opportunities**
2. **Interactive learning**
3. **Improve Overall learning experience.**

Credits: **2**	Max. Marks: **25+75**	Min. Passing Marks:

Suggested Readings:
1. HTML 5 in simple steps -Dreamtech Press
2. A beginner's guide to HTML NCSA,14th May,2003
3. Creating a Web Page and Web Site College,2002
   Reference Books:
   Beginning CSS: Cascading Style Sheets for Web Design Wiley India

Lab Work on Web Designing:

1. Create a static webpage using table tags of HTML.
2. Create a static web page which defines all text formatting tags of HTML in tabular format.
3. Create a webpage using list tags of HTML.
4. Create webpage to include image using HTML tag.
5. Create employee registration webpage using HTML form objects.
6. Create an HTML file (e.g. first_page.html) that specifies a page that contains a heading and two paragraphs of text. Use the HTML tags <h1>, </h1>, <p> and </p> in this exercise. As the texts in the
  * heading and paragraphs you can use any texts you like.
  * Add an unordered list to this web page. An unordered list should look like the following when
  * it is shown by a browser:
  * An unordered list can be specified with the tags <ul> and .
An unordered list typically contains a number of list items that can be specified with tags <li> and .
  * After you have created your unordered list, check out what happens when you
  * convert it to an ordered list by replacing the tags <ul> and with <ol> and
  * , respectively.
  * Add an image to your web page. In this exercise you must use the <img> tag. As an image, you
  * can use any .jpg or .png file you find on the Internet.

7. Create another .html file that contains a heading and a couple of paragraphs. You could name this new file another_page.html, and you should place it into the same folder where your first .html is. After you have created the new .html page, add a link to the first page so that the browser will load another_page.html when you click the text Go to the other page. in the first page. You need to use the <a> and tags in this exercise. Inside the tag <a> you need to use a href attribute that specifies which page will be loaded when the link is clicked.

8. HTML tags like <a> can have certain attributes. The href attribute is mandatory in the <a> tag. Additionally it is possible to use the title attribute which specifies a text that emerges when the mouse cursor is moved above a link. This kind of text is called a tool tip. Modify the link that you created in the previous exercise so that a tool tip says "This leads you to another page." when the mouse cursor is over the link.

9. It is possible to use a picture (image) as a link. Modify your page so that the picture that is on your page will also serve as a link that leads to another page.

10. Design a website for a College. There should be at least 15 web-pages present in the web-site. There should be: One Home page that leads to other pages. The Home page should contain the name of the college as heading along with the college logo. There should be a tab with the following links:

- Home;
- Academics;
- Admission;
- Gallery.
- There should be an appropriate description of the college on the home.

B.Sc.-III (COMPUTER APPLICATION)

Course Title: PROJECT

Research Project Guidelines for V and VI Semester

1. **Objectives of the Project**
- To facilitate the student to independently formulate and solve a social, philosophical, commercial, or technological problem and present the results in written and oral form.
- To render students to the real life problems.
- To provide opportunities to students to interact with people and present them confidently.

2. **Types of Project**

The students are expected to work on:

(1) Application Oriented Project or
(2) Research Oriented Project.

However, it is not mandatory for a student to work on a real-life project. The student can formulate a project problem with the help of his Guide and submit the project proposal of the same. **Approval of the project proposal is mandatory.** If approved, the student can commence working on it, and complete it. It is upon the student to carry the same project of V semester to VI semester OR choose a new project for VI semester. Use the latest versions of the software packages for the development of the project.

3. **Software and Broad Ideas of Application**

- **Languages** - C++, Java,Python
- **Scripting Languages** - PHP,JSP, SHELL Scripts (Unix),
- **.NET Platform** - F#,C#. Net, Visual C#. Net, ASP.Net
- **Middle Ware(Component) Technologies** - COM/DCOM, Active-X, EJB
- **Front-End/GUI Tools** - .Net Technologies, Java
- **Back-End/DBMS** - Oracle, SQL Plus, MY SQL, SQL Server
- **UNIX Internals** - Device Drivers, RPC, Threads, Socket programming
- **Real time Operating Systems/Embedded Skills** - LINUX, Raspberry Pi, Arduino.
- **Application and Research Areas** - Financial / Insurance / Manufacturing / Multimedia / Computer Graphics / Instructional Design/ Database Management System/ Internet / Intranet / Computer Networking-Communication Software development/ E-Commerce/ ERP/ MRP/ TCP-IP programming / Routing protocols programming/ Socket programming

4. **Eligibility of the Guide**

Guide should be a regular teacher of the University/College/Higher Education Institute.

Student can also do the project under the guidance of regular teacher of Institute of National Importance .

5. **Introduction to the Project**

The student should include the details in the project diary, in which they will record the progress of their project throughout the course. The project report should be documented with scientific approach to the solution of the problem that the students have sought to address. The project report should contain enough details to enable examiners to evaluate the work. The important points should be highlighted in the body of the report, with details often referred to appendices.

6. **Structure and Format of the Project**

Chapter 1 to 4 should be submitted in Semester V in spiral binding and these chapters have also to be included in Semester VI report if same project is carried from V to VI semester. If different projects are taken than complete project report is to be submitted in each semester. Semester VI report has to be hard bound with golden embossing. Students will be evaluated based on the project in V and VI semester independently.

(i)   Title Page:

Sample format of Title page is given below.

(All the text should be in Times New Roman)

<TITLE OF THE PROJECT>
(NOT EXCEEDING 2 LINES, 24 BOLD, ALL CAPS)

A Project Report (12 Bold)

Submited in partial fulfilliment of
the Requirement of the award of the
Degree of (Size- 12)

BACHELOR OF SCINCE (14 BOLD, CAPS)

By (12 Bold)

Name of The Student (Size
15, title case) Roll Number
(Size- 15)

COLLEGE LOGO

DEPARTMENT
NAME FACULTY NAME
(12 BOLD, CAPS)