Structure & Syllabus for Semester-V

BACHELOR OF COMPUTER APPLICATIONS (BCA) Programme

Gujarat University

2025 - 2026

As per NEP 2020 CURRICULUM AND CREDIT FRAMEWORK FOR UNDERGRADUATE PROGRAMMES, UGC

&

Resolution No. KCG/admin/2023-24/0607/kh.1

of

Education Department, Govt. of Gujarat

STRUCTURE FOR SEMESTER - 5
GUJARAT UNIVERSITY
Bachelor of Computer Applications (B.C.A.)
(as per NEP 2020)

COURSE:	**Bachelor Of Computer Applications (B.C.A.)**
MAJOR:	**COMPUTER APPLICATIONS**
MINOR:	**1. COGNITIVE MATHS**
	2. DATA SECURITY
	3. WEB TECHNOLOGIES

SEMESTER – 5

MAJOR

CODE	COURSE	CREDITS
DSC-C-BCA-351T	System Analysis: Design & Development (Internal Evaluation of SDP 1: Viva Voce)	4
DSC-C-BCA-352T	Problem Solving Using Python	4
DSC-C-BCA-353P	Practical Solutions Using Python	4

MINOR

CODE	COURSE	CREDITS
DSC-M-BCA-354T	Digital Marketing in E-Commerce	4
DSC-M-BCA-354P	Digital Marketing & Search Engine Optimization	4
	OR	
DSC-M-BCA-354T	Block Chain Technology	4
DSC-M-BCA-354P	Block Chain Technology Practical	4
	OR	
DSC-M-BCA-354T	Foundation of Mathematical Applications	4
DSC-M-BCA-355P	Web Applications Development using PHP	4

SKILL ENHANCEMENT COURSE
(Any ONE Course. Course can also be chosen from Basket)

SEC-BCA-356	Project Management suing SCRUM	2
SEC-BCA-356	Web Skill Development tools (Git, GitHub, Google Docs, Google sheet)	2
SEC-BCA-356	Information Security	2
SEC-BCA-356	Concepts of IOT	2
SEC-BCA-356	Network Administration	2
	TOTAL CREDITS	**22**

Course Name: System Analysis - Design & Development

Course Code: DSC-C-BCA-351 T

Credits: 4

Course Outcomes:

The aim of this course is to enable students to

- Understand different models and draw data flow diagrams
- Learn how to create UML diagrams.
- Understand the elements, rules and construction of UML diagrams.
- Prepare data dictionary for the system

Prerequisites:

- NIL

Contents:

Unit	Particulars	Hours	Credits
1	**System analysis and design** – Introduction, Overview of Feasibility Study (Operational, Technical, Economic, Schedule) **Requirement Modeling** – Fact finding techniques (Interview, Document Review, Observation, Questionnaires and surveys) **Data and Process Modeling** – Data Flow Diagram (Concept, Symbols, Rules, Construction of DFD) **Data Dictionary** – Concepts, Rules, Construction of data dictionary	15	1
2	**Object Oriented Analysis and Design** – Concept, Constituents of Object oriented analysis – Class and Object, Link and Association, Generalization and Specialization, Aggregation and Composition, Coupling and Cohesion, Components, Interfaces **UML diagrams** – Introduction Use-case Diagram – Introduction, Scope of use-case diagram, Benefits of use-case diagram, Elements of use-case diagram (Actors, use-cases, relationship between actor and use-case, relationship between use-cases, relationship between actors) , Guidelines for design of use-case diagram, Construction of use-case diagram. **Sequence Diagram** – Introduction, Elements of sequence diagram (Lifeline, Activation, Messages, Guards, Combined fragments, Objects), Guidelines for design of sequence diagram, Construction of sequence diagram	15	1
3	**Class Diagram**- Introduction, Elements of class diagram (Classes, Relationship, Association class, Package, Interface), Guidelines for design of class diagram, Construction of class diagram	15	1

	Object Diagram – Introduction, Elements of object diagram (Objects, Links), Guidelines for design of object diagram, Construction of object diagram		
4	**Activity Diagram** – Introduction, Elements of activity diagram (Initial state, Final state, action/Activity, Transitions, Decisions, Synchronization, Fork and Join, Swimlanes, Object and Object Flow, Guidelines for design of activity diagram, Construction of activity diagram **State-chart Diagram** – Introduction, Elements of state-chart diagram (Initial state, Final state, State, Transition) Guidelines for design of state chart diagram, Construction of state chart diagram	15	1

Textbook:

1. System Analysis and Design Methods 9th edition (Unit-1)
   Publisher: Cengage Learling
   Author: Gary B. Shelly, Thomas J. Cashman, Harry J. Rosenblatt

2. Magnifying Object-Oriented Analysis and Design (Unit-2,3,4)
   Publisher: PHI
   Author: Arpita Gopal and Netra Patil

References:

1. System Analysis and Design 8th edition
   Publisher: Pearson
   Author: Kendall and Kendall

Other Web References:

https://www.geeksforgeeks.org/types-of-feasibility-study-in-software-project-development/
https://www.w3schools.in/dbms/fact-finding
https://www.geeksforgeeks.org/short-note-on-data-dictionary/

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- Understand system analysis and data flow diagram
- Understand types of UML diagrams
- Understand the elements, rules and construction of UML diagrams.
- Prepare data dictionary for the system

Course Name: Problem Solving Using Python

Course Code: DSC-C-BCA-352T

Credits: 4

Course Outcomes:

On the completion of the course, students will:

- Understanding Core Python Programming , Python Libraries and concepts of OOP
- Understanding Python Database connectivity
- Knowledge of Data analysis and Data Visualization in Python using Pandas and Matplotlib

Prerequisites:

Basic Knowledge of Computer Operations

Contents

Unit	Particulars	Hours	Credits
1	**Python Introduction** Features of Python, Flavours of Python, PVM, Memory Management and Garbage Collection in Python, Comparisons between Python, C, , Java **Data Types in Python** Built-In Datatypes: None types, Numeric types, Converting the datatypes explicitly Sequence in Python : Str, bytes, bytearray, list, tuple ,range Sets : set, frozenset, Mapping types Determining the datatype of a Variable **Python Fundamentals and Control Flow Statements** Tokens, keywords, Identifiers Membership Operators ,Identity Operators Output Statements, Input Statements If , if-else , if-elif-else, match case Loops : while , for , infinite, nested, else suite Pass statement, Assert Statement, Return Statement	15	01
2	**Arrays** Array, Advantages of Array, Creating an Array, Importing the array module ,Indexing Slicing and Processing the arrays **Functions** Difference between a function and a method Defining-calling and returning(single and multiple) results from a function Pass by Object Reference, Positional arguments, Keyword arguments, Default arguments, Variable length arguments Anonymous Functions	15	01

	List, Tuples and Dictionary Exploring List, Creating lists using range() function, Updating the elements of the list, Concatenation of two lists, Repetition of lists, Membership in lists, Aliasing and Cloning lists, Methods to process List Nested Lists Tuples, Creating and accessing Tuple elements, Basic operations on Tuples, Functions to process tuples, Nested Tuples and its sorting. Introduction to Dictionaries, Operations on Dictionaries, Dictionary methods, Converting List into Dictionary		
3	**Classes & Objects** Creating a class, The Self variable, Constructor, Types of variables, Types of methods **Inheritance & Polymorphism** The super() method, Types of Inheritance : Single, Multiple Method Resolution Order (MRO) Polymorphism : Operator Overloading, Method Overloading, Method Overriding **Exception Handling** Exceptions, Exception Handling, Types of Exceptions	**15**	**01**
4	**Database Management** Introduction to MySQL, Installing MySQL Connector, Verifying the Connector Installation, Perform CRUD (Create, Read, Update, Delete) in python, Commit Transaction **Data Analysis With Pandas** Install & Configure Pandas : Install PIP, create Virtual Environment, Activate Virtual Environment, Install Pandas 2.0, verify installation, Pandas Data structure : Series, Dataframe Creating Data Frame from an Excel Spreadsheet, from .csv files, , from Python Dictionary, from list and tuples Operations on Data frames : Knowing number of rows and columns, Retrieving rows from Data frame, Retrieving a range of rows Retrieving column names, column data, from multiple columns, Displaying Statistical information, Knowing the index range,Setting a column as index, Sorting the data, Handling missing data Merging and Joining DataFrames: Merging DataFrames using merge() Function, Joining DataFrames using join() Method Grouping and Aggregating Data **Data Visualization with Matplotlib** Bar Graph, Histograms, Creating a pie chart and Line Graph	**15**	**01**

Text Book :

1. Core Python Programming
   By Dr. R. Nageshwara Rao , 2nd Edition
2. Learning Pandas 2.0 by Matthew Rosch

Reference Books:

1. A Byte of Python, By Swaroop C H
2. Python Cookbook, Recipes of Mastering Python 3,
   By David Beazely & Brian K. Jones
3. Pandas for Everyone: Python Data Analysis by Daniel Y. Chen

Web Resources:

https://www.python.org/about/apps/
https://www.w3schools.com/python/default.asp
https://www.programiz.com/python-programming/tutorial
https://www.programiz.com/python-programming/match-case
https://www.geeksforgeeks.org/crud-operation-in-python-using-mysql/
https://www.geeksforgeeks.org/data-visualization-using-matplotlib/
https://www.geeksforgeeks.org/how-to-calculate-summary-statistics-in-pandas/

Required Softwares:

Python 3.10 or higher
IDE: IDLE
Database: MySQL

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

- Gain Proficiency in Python Syntax
- Competence in handling various data types and structures, such as lists, dictionaries, and tuples.
- Capability to identify, debug, and handle errors and exceptions effectively
- Implementing Python Database Connectivity
- Understanding and applying object-oriented programming (OOP) concepts like classes, objects, inheritance, and polymorphism.
- Understanding Data Analysis and Data Visualization in Python

***** * *****

Course Name: Practical Solutions Using Python

Course Code: DSC-C-BCA-353 P

Credits: 4

Course Outcomes:

On the completion of the course practically students will:

1. Understand the Python programming and Object Oriented Programming concepts.
2. Understanding Python Database connectivity
3. Understanding Data analysis and Data Visualization in Python using Pandas and Matplotlib

Prerequisites:

Basic computer skills, such as saving files in multiple versions and formats

Unit	Particulars		Hours	Credits
1	**Introduction to Python ,Data Types and Control Flow Statements**		30	01
	1	Write a program to swap two numbers without taking a temporary variable		
	2	Write a program to display sum of two complex numbers.		
	3	Write a program to create a byte type array, read, modify, and display the elements of the array		
	4	Create a sequence of numbers using range datatype to display 1 to 30, with an increment of 2.		
	5	Write a program to find out and display the common and the non common elements in the list using membership operators		
	6	Create a program to display memory locations of two variables using id() function, and then use identity operators two compare whether two objects are same or not.		
	7	Write a program that evaluates an expression given by the user at run time using eval() function. Example: *Enter and expression: 10+8-9*2- (10*2) Result: -20*		
	8	Write a menu driven program to perform the following menu: (1) Find Area of Circle (2) Find Area of Triangle (3) Find Area of Square (4) Find Simple Interest (5) Exit. (using match-case)		
	9	Write a program to assert the user enters a number greater than zero		
	10	Write a program to search an element in the list using for loop and also demonstrate the use of "*else"* with for loop.		
	11	Write a python program that asks the user to enter a length in centimeters. If the user enters a negative length, the program should tell the user that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. (2.54 = 1 inch)		
2	**Arrays , Functions, List, Tuples and Dictionaries**		30	01
	1	Create a program to retrieve, display and update only a range of elements from an array using indexing and slicing in arrays		

	2	Write a program to understand various methods of array class mentioned: append, insert, remove, pop, index, ,tolist and count.		
	3	Write a program to sort the array elements using bubble sort technique.		
	4	Create a program to search the position of an element in an array using index() method of array class.		
	5	Write a program to generate prime numbers with the help of a function to test prime or not.		
	6	Write a python program that removes any repeated items from a list so that each item appears at most once. For instance,the list [1,1,2,3,4,3,0,0] would become [1,2,3,4,0].		
	7	Write a program to pass a list to a function and display it.		
	8	Write programs to demonstrate the use of Positional Argument, keyword argument , default arguments , variable length arguments		
	9	Write a lambda/Anonymous function to find bigger number in two given numbers		
	10	Create a program name "employee.py" and implement the functions DA, HRA, PF, and ITAX. Create another program that uses the function of employee module and calculates gross and net salaries of an employee		
	11	Write a program to create a list using range functions and perform append, update and delete elements operations in it.		
	12	Create a sample list of 7 elements and implement the *List methods* mentioned: append, insert, copy, extend, count, remove, pop, sort, reverse and clear.		
	13	Write a program to create nested list and display its elements.		
	14	Write a program to accept elements in the form of a tuple and display its minimum, maximum, sum and average.		
	15	Create a program to sort tuple with nested tuples		
	16	Create a dictionary that will accept cricket players name and scores in a match. Also we are retrieving runs by entering the player's name.		
	17	Write a program to convert the elements of two lists into key-value pairs of a dictionary.		
	18	Create a python function to accept python function as a dictionary and display its elements.		
3	**Concepts of OOP and Exception Handling**		**30**	**01**
	1	Write a program to create a Student class with a constructor having more than one parameter . Also create a method named display() to view the student details.		
	2	Write a program to demonstrate the use of instance and class/static variables		
	3	Write a program to store data into instances using mutator methods and to retrieve data from the instances using accessor methods.		
	4	Write a program to use class method to handle the Common features of all the instance of Student class.		
	5	Write a program to create a static method that counts the number of instances created for a class.		

	5	Create a Bank class with two variables Name and Balance. Implement a constructor to initialize the variable. Also implement deposit and withdrawal using instance methods.		
	6	Create a Student class to with the methods set_id, get_id, set_name, get_name, set_marks and get_marks where the method name starting with set are used to assign the values and method name starting with get are returning the values. Save the program by *student.py*. Create another program to use the Student class which is already available in *student.py*.		
	7	Write a program to access the base class constructor and method in a sub class by using *super().*		
	8	Write a program to implement single inheritance in which two sub classes are derived from a single base class.		
	9	Write a program to implement multiple inheritance using two base classes.		
	10	Write a program to understand the order of execution of methods in several base classes according to method resolution order (MRO)		
	11	Write a program to check the object type to know whether the method exists in the object or not.		
	12	Write a program to overload the addition operator (+) to make it act on the class objects.		
	13	Write a program to show method overloading to find sum of two or three numbers.		
	14	Write a program to override the super class method in Subclass		
	15	Write a program to handle some built in exceptions like *ZeroDivisionError*		
	16	Write a program to handle multiple exceptions		
4	**Python Database Management. Data Analysis and Data Visualization**		**30**	**01**
	1	Write a program to create a database named “Sample_DB” in MySQL(). And create an EMPLOYEE Table in it with fields like eid,name and sal. Also enter some valid records in table. First ensure connection is made or not and then check if the database Sample_DB already exists or not, if yes then print appropriate message. Also display all records of Employee table.		
	2	Write a program to increase the salary (sal) of an employee in the employee table by accepting the employee identity number (eid) from the user.		
	3	Write a program to delete a row from an employee table by accepting the employee identity number (eid) from the user		
	4	Create a Pandas Series from a list of integers		
	5	Create a dataframe from .csv file		
	6	Create a dataframe from a dictionary		
	7	Create a DataFrame with columns ['Name', 'City']. Access column "City" and display it		

	8	Create a DataFrame with columns ['Name', 'Age', 'Score']. Sort the DataFrame based on the 'Score' column in descending order.		
	9	Create a DataFrame df = pd.DataFrame ({'A': [1, None, 3], 'B': [None, 4, 5]}). Fill missing values in column 'A' & 'B' with 0		
	10	Create two DataFrames & Merge the two DataFrames(using merge()) based on the 'ID' column. **df1 = pd.DataFrame({'ID': [1, 2], 'Name': ['Krishna ', 'Arjun']})** **df2 = pd.DataFrame({'ID': [1, 2], 'Age': [25, 30]})**		
	11	Create a DataFrame df **= pd.DataFrame({'Category': ['A', 'B', 'A', 'B'], 'Value': [10, 20, 30, 40]}).** Group the data by the 'Category' column and calculate the multiple aggregation functions like mean, maximum and minimum of the 'Value' for each group.		
	12	Write a program to display employee id numbers on X-axis and their salaries on Y- axis in the form of bar graph		
	13	Write a program to display employee id numbers on X-axis and their salaries on Y- axis in the form of bar graph for two departments of a company		
	14	Write a program to display a histogram showing the number of employees of specific age groups.		
	15	Write a program to display a pie chart showing the percentage of employees in each department of a company		
	16	Write a program to create a line graph to show the profits of a company in various years		

Text Book :

1. Core Python Programming
   By Dr. R. Nageshwara Rao , 2nd Edition
2. Learning Pandas 2.0 by Matthew Rosch

Reference Books:

1. A Byte of Python, By Swaroop C H
2. Python Cookbook, Recipes of Mastering Python 3,
   By David Beazely & Brian K. Jones
3. Pandas for Everyone: Python Data Analysis by Daniel Y. Chen

Web Resources:

https://www.python.org/about/apps/
https://www.w3schools.com/python/default.asp
https://www.programiz.com/python-programming/tutorial
https://www.programiz.com/python-programming/match-case
https://www.w3resource.com/python-exercises/pandas/index.php

Required Softwares:

Python 3.10 or higher
IDE: IDLE
Database: MySQL

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

- Gain Proficiency in Python Syntax and implement various python programs
- Implement Python Database Connectivity.
- Implement Data Analysis with Pandas and Data Visualization using Matplotlib in Python

Structure & Syllabus for Semester-V

BACHELOR OF COMPUTER APPLICATIONS (BCA) Programme

Gujarat University

2025 - 2026

As per NEP 2020 CURRICULUM AND CREDIT FRAMEWORK FOR UNDERGRADUATE PROGRAMMES, UGC

&

Resolution No. KCG/admin/2023-24/0607/kh.1

of

Education Department, Govt. of Gujarat

STRUCTURE FOR SEMESTER - 5
GUJARAT UNIVERSITY
Bachelor of Computer Applications (B.C.A.)
(as per NEP 2020)

COURSE:	**Bachelor Of Computer Applications (B.C.A.)**
MAJOR:	**COMPUTER APPLICATIONS**
MINOR:	**1. COGNITIVE MATHS**
	2. DATA SECURITY
	3. WEB TECHNOLOGIES

SEMESTER – 5

MAJOR

CODE	COURSE	CREDITS
DSC-C-BCA-351T	System Analysis: Design & Development (Internal Evaluation of SDP 1: Viva Voce)	4
DSC-C-BCA-352T	Problem Solving Using Python	4
DSC-C-BCA-353P	Practical Solutions Using Python	4

MINOR

CODE	COURSE	CREDITS
DSC-M-BCA-354T	Digital Marketing in E-Commerce	4
DSC-M-BCA-354P	Digital Marketing & Search Engine Optimization	4
	OR	
DSC-M-BCA-354T	Block Chain Technology	4
DSC-M-BCA-354P	Block Chain Technology Practical	4
	OR	
DSC-M-BCA-354T	Foundation of Mathematical Applications	4
DSC-M-BCA-355P	Web Applications Development using PHP	4

SKILL ENHANCEMENT COURSE
(Any ONE Course. Course can also be chosen from Basket)

SEC-BCA-356	Project Management suing SCRUM	2
SEC-BCA-356	Web Skill Development tools (Git, GitHub, Google Docs, Google sheet)	2
SEC-BCA-356	Information Security	2
SEC-BCA-356	Concepts of IOT	2
SEC-BCA-356	Network Administration	2
	TOTAL CREDITS	**22**

Semester – V

BACHELOR OF COMPUTER APPLICATIONS

MINORS

1. COGNITIVE MATHEMATICS (CG)
2. DATA SECURITY (DS)
3. WEB TECHNOLOGIES (WTECH)

Course Name: FUNDAMENTALS OF MATHEMATICAL APPLICATIONS

Course Code: DSC-M-BCA-354T
Credits: 4
Course Outcomes:
On the completion of the course students will:

- To understand basic principle of mathematics and discrete mathematics
- To improve logical thinking.
- To use principals and logics as supplement to develop other subjects.

UNIT	TOPIC/ SUBTOPIC	TEACHING HOURS	CREDITS
1	[1] SET THEORY: Introduction, Methods of representation, Examples of set , Various types of set [Finite set, infinite set, Empty set, Singleton set, Equivalence set , Equal set, Disjoin set, Sub set, Proper and improper sub set, power set] Set Operations [union, intersection , complement of set, Set difference , Symmetric difference] , Venn-diagrams , Properties of set operations[Commutative, associative, distributive, de morgan's law Cardinality , Cartesian product. [2] FUNCTION : Introduction & Definition , Domain , Codomain and range of function, Types of function:(1) on base of mapping: one-one , many one, constant, onto, into (2) on base of degree : constant , linear , quadratic , exponential , cubic , polynomial, (3) Graphs of functions.	15	01
2	[1] RELATIONS : Introduction , Universal and Empty relation, inverse of relations ,Total numbers of relations , Types of relations : Reflexive , Symmetric, Transitive , Antisymmetric , Asymmetric , Irreflexive Equivalence relations , Partition of set , Partial order relations , Hasse Diagrams of posets , Upper bound & least upper bound , Lower bound & Greatest lower bound . [2] Lattice & Boolean Algebra : Bounded lattice , complete lattice , Distributive lattice , Complemented lattice , Boolean Algebra , Properties of Boolean Algebra , Minterms and Maxterms , Sum of product & product of sum , Complete sum of product form.	15	01
3	[1] MATRIX Introduction, Definition , Notations , Types of Matrix [Row , column , rectangular , square, diagonal , scalar , identity , zero , upper triangular , lower triangular , singular, symmetric , skew symmetric , Transpose matrix] Arithmetic Operations : Addition , Subtractions , Multiplications , Rank of matrix , Inverse matrix , Solve the equations by using inverse matrix . [2] LOGIC AND PROPOSITIONAL CALCULUS Introduction , Propositions and compound propositions , Basic logical operations[Conjunction , Disjunctions, Negation] , Truth table , Tautologies and Contradictions , Law of the algebra of propositions [Idempotent , Associative , Commutative , Distributive , Identity , Compliment , Involution , De Mogen's]	15	01
4	[1]Permutation & Combination	15	01

	Introduction, Factorial notation, permutations of n different things [exclude circular permutations], permutations of things if some of them are identical , Restricted permutations. Combinations of r items out of n , Restricted combinations [2] Probability : Introduction , Basic terms , Probability of various events by using Addition and Multiplication rule of probability, Probability of an event if selection is with replacement or without replacement, Baye's theorem.		

P.S. Use of Calculator by student is allowed

Reference Books :

1. Business Mathematics by D.C. SANCHETI & V.K. KAPOOR …….. Sultan chand & Sons
2. Discrete Mathematics by SEYMOUR LIPSCHUTZ, MARC LARS LIPSON, VARSHA PATIL …….. Mc Grew Hill
3. Business Mathematics BY P.MARIAPPAN ……..Pearson
4. Fundamentals of Statistics by S. C. GUPTA …….. Himalaya Publishing House
5. Discrete Mathematics and its Applications by Kenneth H. Rosen , Kamala Krithivasan…….. Mc Grew Hill

Course Name: Web Application Development using PHP
Course Code: DSC-M-BCA-355 P
Credits: 4
Course Outcomes:

The aim of this course is to enable students to

- Get familiar with server-side language for web development.
- Learn basic concepts of PHP, functions for database operations using MySQL.
- Learn about AJAX in PHP for faster processing of web applications.
- Get familiar with validations.

Prerequisites:

- Basic knowledge of data types, HTML tags.

Unit-1 Introduction to PHP

Introduction: Basic PHP syntax, PHP comments, data types in PHP,PHP variables, Echo and print statement, PHP strings(functions), PHP math functions, PHP operators, PHP if…else statements, switch case, Loop (While, do while , for, for each), PHP functions , PHP arrays(Indexed, Associative, multidimensional), PHP form handling

Unit-2 Advanced PHP

MYSQL database, MySQL connect, Create database, create table, Insert data, Select data, Update data, Delete data, Display data, AJAX introduction, PHP and AJAX, Methods and properties of XMLHttpRequest object, Concept of Cookie and Session in PHP

Unit	Particulars		Hours	Credits
1	**Basic Programs**		**30**	**1**
	1	Write a PHP program to check whether the number entered is Positive / Negative or Zero entered by user		
	2.	Write a PHP program to find maximum number from the two numbers entered by user		
	3.	Write a PHP program that prints Fibonacci series till the number entered by user.		
	4.	Accept a string from user. Write PHP program to check whether that entered string is palindrome or not.		
	5.	Write a PHP program to accept a number from user and find its square and cube.		
	6.	Write a PHP program to find sum of n numbers. Take input from user.		
	7.	Accept a two numbers from user. Write a PHP program to Add, Subtract and Multiply the numbers and displays result.		
	8.	Accept a number from user as “Radius” of a circle. Write PHP program find Area of a Circle. (Area = PI * radius * radius).		
	9.	Write a PHP program to print all even numbers till the entered number.		

	10.	Create a function that accepts 3 numbers as parameters and check whether the sum of 3 numbers is prime or not. Note: Input should be collected from user using an HTML page.		
	11.	Create a function that accepts a number as argument and displays sum of digit of a number. E.g. If Number is 123 then sum of Digits is 6 i.e., 1+2+3 =6 Note: Input should be collected from user using an HTML page.		
	12.	Write a PHP program that changes color of the web page using switch case.		
2.	**Session, Cookies, Arrays, Functions**		**30**	**1**
	1.	Write a PHP script to set a cookie named "username" with the value "Welcome" with an expiration time of one hour and display its value.		
	2.	Write a PHP script to delete a cookie named "welcome".		
	3.	Write a PHP script to retrieve and display the value of the session variable "loginid".		
	4.	Write a PHP script to check if a cookie named "visited" exists. If it does, display a welcome message; otherwise, display a default message.		
	5.	Create an array with 5 elements and print all array elements.		
	6.	Create an array with 5 elements. Find and display minimum and maximum value from the array.		
	7.	Write a PHP program that deletes duplicate values from array.		
	8.	Write a PHP program that checks whether the element is exists in the array or not. Give acknowledgement from the same.		
	9.	Create an associative array and display its elements.		
	10.	Create an array named $sub, assign five elements to it and display the elements assigned using for loop and foreach statement		
	11.	Create an array named $student that stores 5 elements bounded to different keys and access the same using the key element.		
	12.	Write a program in PHP to demonstrate the use of multidimensional arrays.		
	13.	Write a program in PHP to sort the array of given 5 numbers in ascending and descending order.		
	14.	Write a program to count the total number of times a specific value appears in an array.		
	15.	Create two functions in PHP, parameterized and non parameterized for implementing string concatenation operation.		
3.	**MySQL**		**30**	**1**
	1.	Write a PHP script for that creates a database named "DB-1"in MySQL. And also create a table “myTable” in above created database “DB-1”.		
	2.	Write a PHP script for creating a “Product” table in “MyDB” database with fields Pro_id, Pro_name, Pro_price, Qty,		

		Rate . Also display an acknowledgement for the same as “Table created successfully”.		
	3.	Create a form containing four input fields(Pro_id, Pro_name, Pro_price, QOH) and Submit button. When the user clicks on the submit button, PHP script should be executed which inserts the record in the product table.		
	4.	Create a form containing one input field (Product_id) and a Delete button. When the user clicks on the Delete button a PHP script should get executed and should delete the record of the product for the Product_id specified.		
	5.	Create a form containing two input fields (Product_id, Rate) and Update button. When the user clicks on the Update button, the Rate of the Product_id specified should get updated by 5% of the current rate using a PHP script.		
	6.	Create a form containing one input field (Product_id) and a search button. When the user clicks on the Search button a PHP script should get executed and should display the details of the product for the Product_id specified.		
	7.	Write a PHP script for creating a “Product” table in “MyDB” database with fields Pro_id, Pro_name, Pro_price, Qty, Rate . Also write code to update product price to 100 whose product id is <4 in Product table”.		
	8.	Write a PHP script for creating a “Student” table in “MyDB” database with fields Student_id, Student_name, Course, Age, MobileNo . Also display an acknowledgement for the same as “Table created successfully”.		
	9.	Write a PHP Script to update record (Stud_Address) of student table where sid=13		
	10.	Write a PHP Script to Delete Record of Student Table by clicking on Delete Button by specifying Student_ID.		
	11.	Write a PHP Program to update a record with your own value into the table Student against each column (Student ID, Student Name, Course ID, and Mobile No). Note: (a) Input should be collected from user using an HTML page. (b) Make Sure Student ID, Course ID, and Mobile No must not be Negative. (c) Student Name should not be Blank.		
	12.	Write a PHP Script to Update Record of Employee table (Empname, Empsalary, Empaddress) from Employee Table. Update Employee Name to “ABC” whose Employee number is 3.		
	13.	Write a PHP script that creates a database named "Product_Details" in MySQL. Create an HTML form containing four input fields (Pro_id, Pro_name, Pro_price, and QOH) And Submit button. When the user clicks on the submit button a PHP Script should be Executed which inserts the record in the product table. Note: input should be collected from user using an html page and there should not be duplicate product id in the table.		

	14.	Write a PHP Program to update a record with your own value into the table Employee against each column (Employee ID, Employee Name, Job Code, Salary and Mobile No). Note: (a) Input should be collected from user using an HTML page. (b) Make Sure Employee ID, Salary, and Mobile No must not be Negative. (c) Employee Name should not be Blank. (d) Salary length must not be greater than 5 digits.		
4.	**AJAX and Validation**		**30**	**1**
	1.	Create a form containing one input field (MyName). When the user enters his/her name and press any key, the form should display a welcome message for the user. Implement using AJAX.		
	2.	Create a form to enter a string. Write a PHP program for converting a string into uppercase using AJAX.		
	3.	Create a form containing a combobox with some product names as items. Whenever a user selects a particular product from the combobox, that selected item should be printed on the page. (i.e. without pressing submit button). Implement using AJAX.		
	4.	Create a form containing a combobox with some color names as items. Whenever a user selects a particular color from the combobox, that selected item should be printed on the page. (i.e. without pressing submit button). Implement using AJAX.		
	5.	Create a form containing a radiobutton with some product names. Whenever a user selects a particular product from the radiobutton, Display on the page as “You have selected_____ product”. Implement using AJAX.		
	6.	Create a form containing one input field (Number). When the user enters the number and as the key is released, the form should display “whether the number is odd or even” with a message to the user. Implement using AJAX.		
	7.	Write a program to validate a blank field and also validate the length of a string entered (i.e. minimum length of 5).		
	8.	Write a program to validate and Email ID using regular expression and by using DOM		
	9.	Write a program to validate a username field and also validate the length of the username entered **(i.e. minimum length of 7 and maximum length of 12)** using AJAX**.**		
	10.	Write a PHP program to print user data using AJAX. Make one drop down select user id and print specific user detail by matching user id.		
	11.	Create a form containing one input field (Number). When the user enters the number and as the key is released, the form should display **“whether the number is greater than 50 or not”** with a message to the user. Implement using AJAX		
	12.	Write a program that checks a particular student Id already exists in the Student Table (Stud_id, Stu_Name, MobileNo, Country) or not. If the entered student ID exists		

		then display a message that : “Student ID already exists….”. (Using AJAX)		
	13.	Write a program that checks a particular mobile number already exists in the student (stuId, stu_name, mob, country) table or not. If mobile number exists then display a message **"Mobile Number Already registered. Try another Mobile Number".** If it does not exist then add the data in the student table. Implement using AJAX.		

Textbook:

Developing Web Applications in PHP and AJAX
Publisher: McGraw Hill
By B M Harwani

Reference Books:

1. Teach yourself PHP, MySQL and Apache
   Publisher: Pearson
   By Julie C. Meloni
2. PHP Ajax Cookbook
   Publisher: PACKT Publishing

Other Web References:

https://www.w3schools.com/php/
http://www.learn-php.org/
https://www.tutorialspoint.com/php/

Required Softwares:

1. Notepad++
2. XAMPP or WAMP server

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- To setup and configure XAMPP
- To develop server side programs using PHP in dynamic web development.
- To debug a PHP/AJAX web application.
- To use AJAX for efficient and fast communication between client and server.
