ITE5005	**Open Source Programming**	**L T P J C**
Pre-Req: Nil		**2 0 2 0 3**
		V.1.1

Objectives:

1. To introduce the concept of open source tools, software and their license/copyright policies.
2. To use open source software and tools to develop software
3. To understand how to create open source software applications and can publish it over the Internet and to allow the users to customize the software based on their requirements.

Expected Outcome :

On completion of this course, student should be able to

1. Create open source software applications and can publish it over the Internet.
2. Understand the open source licensing and the importance of using open source products.
3. Customize their software product with respect to existing products by other developers.
4. Develop web-enabled software using common software components.

Module	Topics	L Hrs	SLO
1	**Overview of Open Source Software:** Need of Open Sources, Open source software license; Open source Programming and Tools, Web Server Installation and PHP Introduction.	4	7
2	**Open Source Programming Language-PHP:** Variables, Operators, Constants, Control structures, Arrays, Functions, classes, Handling Files, Server side includes.	5	14
3	**Working With Forms:** HTML and PHP code, Processing Forms, Single page submission, User Input, Form Validation, ,String Manipulation and Regular Expression	4	14
4	**My SQL database programming:** Introduction to MySQL, Datatypes, MySQL Command-Line, SQL Language, Types of Commands- DDL, DML, DCL, Constraints, Select, Orderby, Limit, Working with metadata, Functions - Number, Date, Character, Control Flow, Joins, Groupby, Having, Subquery, Indexing	4	14
5	**Working with PHPMyAdmin:** Creating Databases, Database Engines, Creating Fields, Delete Record, Update Record, View Record, Drop Database/Tables, Creating Fields Primary / Foreign Keys, Unique Key, Insert Record	3	14
6	**Emailing in PHP:** Mail server configuration, Understanding MIME headers, Sending an email, multipart messages, Session tracking using PHP, Graphics Input Validators(using PHP image manipulation functions), cookies	4	7
7	**Programming in CGI-Perl:** Script Morphology, Data Types, Scalars, Lists/Arrays, Hash, Variable Scope, Operators, Control Statements, Files, Functions/ Subroutines, PCRE- Pattern matching.	4	7
8	**Contemporary Issues**	2	
	Total Lecture Hours # **Mode:** Flipped Class Room, [Lecture to be videotaped], Use of computer models to lecture, Visit to Industry, Min of 2 lectures by industry experts	**30**	

Text Book

1. Paul J. Deitel, Harvey M. Deitel, Abbey Deitel, “Internet and World Wide Web: How to Program” Fifth Edition, Prentice Hall, 2011.

Reference Books

1. Tom Christiansen, Brian D Foy, Larry Wall, Jon Orwant, “Programming Perl”, Fourth Edition, O’Reilly Media, 2012.
2. Timothy Boronczyk, Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Beginning PHP6, Apache, MySQL6 web development, Wiley, 2009.

Challenging Experiments

1. Implement on-line quiz by populating a web-page with multiple choice questions from any specialization.
2. Design a web-page containing text field and submit button. Name the textfield as "details". When a submit button is clicked, “submit.php” is called. The submit.php checks data obtained from "details" text field against an array. If the data is a VIT registration number, then it displays the information about the specified student within <pre> tag. If the data obtained from the details field is course name then details about all the students of a course is displayed in a table. If data obtained from the "details" text field is not found then it displays "Information Unavailable".

    17MIT0001 Aman M.Tech Chennai
    17 MIT0002 Ajith M.Tech Banglore
    17 MIT0003 Sujoy M.Tech Mumbai
    16 MIT003 Diksha M.Tech Chennai
    16 BCA0034 Aravind BCA Nagpur
    16 BCA0034 Ashlesh BCA Coimbatore
    (Note: Use Associative array to maintain student data)
3. Write PHP script to mimic STACK and Queue data structure using array.(Design a webpage to populate the array,and trigger the STACK and Queue operation after clicking a button)
4. Write a PHP Script to demonstrate object oriented programming concepts.

    Create a class “Shape” with a constructor to initialize the one parameter “dimension”. Now create three sub classes of Shapes with following methods:

    a) Class “Circle” with methods to calculate the area and circumference of the circle with dimension as radius.
    b) Class “Square” with methods to calculate the area of the square.
    c) Class “Sphere” with methods to calculate the volume of the sphere. Write appropriate main method to create object of each class and test every method.
5. Write a PHP script to create a user defined API to facilitate student record management system.
6. Write a PHP script to implement the below scenario, A final year student named Navin wanted to develop an app for mobile phone. The functionalities of the application defined by Navin are: to play music when an unauthorized person trying to unlock the phone, to make a call to another person, to record the voice call. But, unfortunately he could not complete the project. After few days another student Kavin took over the project. Kavin has defined first two functionalities and also he defined an additional functionality such as ‘to make the phone jump’ and had written code for the same. But he could not complete the project. Later this project

was given to another Student named Pravin who finished this project by defining all the functionalities. Write a java code for the above scenario.

7. Write a PHP script to populate the input file with a set of names by designing a web-page. Then read those names and segregate the names terminate with a letter "i" as well as "a", and move them to one separate file, The set names do not match with above mentioned criteria should be moved into one more another file.
8. Design a web-page with the following fields to facilitate course registration

Name	Textfield
Register number	Textfield
Password	Password
Date-of -Registration	Date –dropdown Month-Dropdown Year-dropdown
Core Courses	Drop down should be populated with all available courses
Elective Course	Five courses need to be displayed with radio button
Email-ID	Textfield

Write a PHP script to extract the data which has been submitted using web-page and validate data (use regular expression) against the below constraints.

i)Name: It must begin with a letter and length should not exceed 8 characters.

ii)Register-Number: It should begin with 16/17 (Eg.16BIT0233/17BIT0111)

iii)Password: It must be of alphanumeric characters.

iv)Date-of-Registration : The number of days should match with a month

(Jan=31days Feb=28 days)

v) Facilitate with multiple selection

vi) The accepted email-id must obey all the qualities of valid email-id account name.

If the provided information is satisfied all the constraints then display them using tabular format.

9. Write the required MySQL command to accomplish the following tasks.

a. Create a simple table countries including columns country_id,country_name and region_id.
b. Create a simple table countries including columns country_id,country_name and region_id which is already exists
c. Create the structure of a table dup_countries similar to countries.
create a table named jobs including columns job_id, job_title, min_salary, max_salary and check whether the max_salary amount exceeding the upper limit 25000
d. Create a table named countries including columns country_id, country_name and region_id and make sure that no countries except Italy, India and China will be entered in the table.

10. Maintain the below mentioned tables inside Bank.db.

    branch(branch-name,branch-city,assets)
    customer (customer-name, customer-street, customer-city)
    account (account-number, branch-name, balance)
    loan (loan-number, branch-name, amount)
    depositor (customer-name, account-number)
    borrower (customer-name, loan-number)
    employee (employee-name, branch-name, salary)

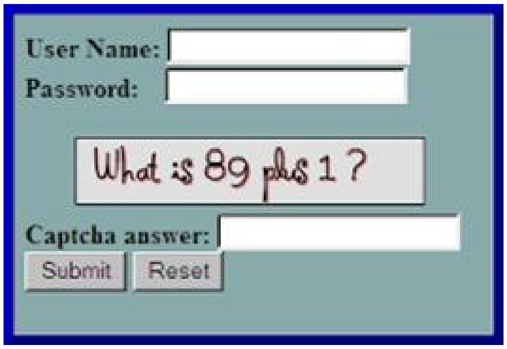
Write the necessary MySQL command to extract the data from the above mentioned tables.

a) To find all loan number for loans made at the VIT Indian bank branch with loan amounts greater than 75000.
b) Find the loan number of those loans with loan amounts between 50000 and 75000
c) Find the names of all branches that have greater assets than some branch located in vellore.
d) Find the customer names and their loan numbers for all customers having a loan at some branch.
e) Find all customers who have a loan, an account, or both:
f) Find all customers who have an account but no loan. (no minus operator provided in mysql)
g) Find the number of depositors for each branch.

(Note: use PHP-MySQL integrated functions)

11. Design a login form as given below. Write PHP scripts to do the following.

a) Validate the mandatory fields user name and password.
b) Generate the given CAPTCHA and validate it.



12. Write a Perl program to validate a credit card number using the following algorithm. It has two parts. If part I fails, immediately return with an error message.

Part I
This includes checking the total number of digits and the number prefix. The table below shows acceptable values for some of the major credit cards.

Card Type	Starts with	Length
American Express	34, 37	15

MasterCard	51-55	16
VISA	4	13, 16

Part-II

- Starting from the right hand side of the card number, skip the last digit.
- Double every alternate number. [from length-1 to 0]
- If the doubled number has 2 digits, add both the digits
- Add together all the doubled numbers with the other non-doubled numbers.

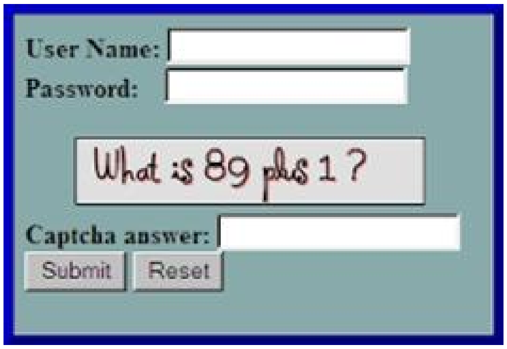
If the sum is divisible by 10, then the card is valid.
Example: Valid Visa Card:**4 0 1 2 8 8 8 8 8 8 8 8 1 8 8 1**

1.
2.
3.
4.

10 Design a login form as given below. Write PHP scripts to do the following.

a) Validate the mandatory fields user name and password.

b) Generate the given CAPTCHA and validate it.



11. Write a Perl program to validate a credit card number using the following algorithm. It has two parts. If part I fails, immediately return with an error message.

Part I
This includes checking the total number of digits and the number prefix. The table below shows acceptable values for some of the major credit cards.

Card Type	Starts with	Length
American Express	34, 37	15
MasterCard	51-55	16
VISA	4	13, 16

Part-II

- Starting from the right hand side of the card number, skip the last digit.
- Double every alternate number. [from length-1 to 0]
- If the doubled number has 2 digits, add both the digits
- Add together all the doubled numbers with the other non-doubled numbers.

If the sum is divisible by 10, then the card is valid.

Example: Valid Visa Card:**4 0 1 2 8 8 8 8 8 8 8 8 1 8 8 1**

Approved by Academic Council	No.:47	Date	05.10.2017