GE–2 Information Technologies – 2 BS601

Theory 2 Hours/Week 2 credits

Unit – I

Introduction to Algorithms and Programming Languages: Algorithm, Control Structures, Flowcharts, Pseudo code, Programming Languages, Generations of Programming Languages.
Database Systems: File Oriented Approach, Database Oriented Approach, Database Views, Three-Schema Architecture, Database Models, Components of DBMS, Introduction of SQL Queries.

Unit – II

Computer Networks: Introduction, Connection Media, Data Transmission Mode, Data Multiplexing, Data Switching, Network Topologies, Types of Networks, Networking Devices, OSI Model.
The Internet: Internet Services, Types of Internet Connections, Internet Security.
Emerging Computer Technologies: Distributed Networking, Peer-to-peer Computing, Grid Computing, Cloud Computing, Utility Computing, On0demand Computing, Wireless Network, Bluetooth, Artificial Intelligence.

Text

Reema Thareja, *Fundamentals of Computers*

References

P. K. sinha, *Computer Fundamentals*
Anita Goel, *Computer Fundamentals*
V. Rajaraman, *Fundamentals of Computers*
E. Balagurusamy, *Fundamentals of Computers*
J. Glenn Brookshear, Dennis Brylow, *Computer Science An Overview*

Note: Student friendly video lecturers pertaining to this course are available at http://spoken-tutorial.org/
Teachers are advised to teach this courses in the computer lab itself, so that the interested students may derive some time to perform few programs their own.

SEC–4 [A] | **Python – 2** | **BS602**

Theory 2 Hours/Week 2 credits

Unit – I

Arrays in Python: Array, Advantages of Arrays, Creating an Array, Importing the Array Module, Indexing and Slicing on Arrays, Processing the Arrays, Types of Arrays, Working with Arrays using numpy, Creating Arrays using array(), linspace, logspace, arange(), zeros() and ones() Functions, Mathematical Operations on Arrays, Comparing Arrays, Aliasing the Arrays, Viewing and Copying Arrays, Slicing and Indexing in numpy Arrays, Dimensions of Arrays, Attributes of an Array, The reshape() Method, The flatten() Method, Working with Multi-dimensional Arrays, Indexing in Multi-dimensional Arrays, Slicing the Multi-dimensional Arrays, Matrices in numpy, Getting Diagonal Elements of a Matrix, Finding Maximum and Minimum Elements, Finding Sum and Average of Elements, Products of Elements, Sorting the Matrix, Transpose of a Matrix, Matrix Addition and Multiplication, Random Numbers.

Strings and Characters: Creating Strings, Length of a String, Indexing in Strings, Slicing the Strings, Repeating the Strings, Concatenation of Strings, Checking Membership, Comparing Strings, Removing Spaces from a String, Finding Sub Strings, Counting Substrings in a String, Strings are Immutable, Replacing a String with another String, Splitting and Joining Strings, Changing Case of a String, Checking Starting and Ending of a String, String Testing Methods, Formatting the Strings, Working with Characters, Sorting Strings, Searching in the Strings, Finding Number of Characters and Words, Inserting Sub String into a String.

Unit – II

Functions: Difference between a Function and a Method, Defining a Function, Calling a Function, Returning Results from a Function, Returning Multiple Values from a Function, Functions are First Class Objects, Pass by Object Reference, Formal and Actual Arguments, Positional Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Local and Global Variables, The Global Keyword, Passing a Group of Elements to a Function, Recursive Functions, Anonymous Functions or Lambdas, Function Decorators, Generators, Structured Programming, Creating our Own Modules in Python, The Special Variable name.

Lists and Tuples: List, Creating Lists using range() Function, Updating the Elements of a List, Concatenation of Two Lists, Repetition of Lists, Membership in Lists, Aliasing and Cloning Lists, Methods to Process Lists, Finding Biggest and Smallest Elements in a List, Sorting the List Elements, Number of Occurrences of an Element in the List, Finding Common Elements in Two Lists, Storing Different Types of Data in a List, Nested Lists, Nested Lists as Matrices, List Comprehensions, Tuples, Creating Tuples, Accessing the Tuple Elements, Basic Operations on Tuples, Functions to Process Tuples, Nested Tuples, Inserting Elements in a Tuple, Modifying Elements of a Tuple, Deleting Elements from a Tuple.

Dictionaries: Operations on Dictionaries, Dictionary Methods, Using for Loop with Dictionaries, Sorting the Elements of a Dictionary using Lambdas, Converting Lists into Dictionary, Converting Strings into Dictionary, Passing Dictionaries to Functions, Ordered Dictionaries.

Text

R. Nageswara Rao, *Corer Python Programming,* Dreamtech Press

References

Mark Lutz, *Learning Python*

Tony Gaddis, *Starting Out With Python*

Kenneth A. Lambert, *Fundamentals of Python*

James Payne, *Beginning Python using Python 2.6 and Python 3*

Paul Gries,*Practical Programming: An Introduction to Computer Science using Python 3*

Note: Student friendly video lecturers pertaining to this course are available at http://spoken-tutorial.org/

Teachers are advised to teach this courses in the computer lab itself, so that the interested students may derive some time to perform few programs their own.

SEC–4 [B] | **Information Security** | **BS602**

Theory 2 Hours/Week 2 credits

Unit – I

Introduction to Information Security – Need for Information Security, Threats to Information Systems, Information Assurance, Cyber Security.
Introduction to Application Security and Counter Measures – Introduction to Application Security, Data Security Considerations, Security Technologies, Security Threats, Security Threats to E-Commerce, E-Cash and Electronic Payment System.

Unit – II

Credit/Debit/Smart Cards, Digital Signature, Cryptography and Encryption, Information Security Governance and Risk Management.
Introduction to Security Policies and Cyber Laws – Need for an Information Security Policy, Introduction to Indian Cyber Law, Objective and Scope of the IT Act, 2000, Intellectual Property Issues, Overview of Intellectual-Property- Related Legislation in India, Patent, Copyright.

Text

Dr. Surya Prakash T, Ritendra G, Praveen Kumar S, KLSI, *Introduction to information security and cyber laws (Dreamtech Publication)*

References

Anderson, Ross, *Security Engineering*
G.R.F. Snyder, T. Pardoe, *Network Security*
Mark Stamp, *Information Security: Principles and Practice*
A. Basta, W.Halton, *Computer Security: Concepts, Issues and Implementation*
Mark S. Merkow, Jim Breithaupt, *Information Security: Principles and Practice*

DSC–3F Computer Networks BS605

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Introduction: Data Communication Components, Line Configuration, Topologies, Transmission Mode, Categories of Networks, ISO Reference Model–Layered Architecture, Functions of Layers, TCP/IP Reference Model.

Transmission Media: Guided Media–Twisted Pair Cable, Coaxial Cable, Optical Fiber, Unguided Media–Satellite Communication, and Cellular Telephony.

Multiplexing: Frequency–Division Multiplexing, Time–Division Multiplexing.

Unit – II

Data Link Layer: Error Detection–VRC, LRC, CRC, Checksum, Error Correction–Hamming Code, Burst Error Correction, Line Discipline–ENQ/ACK, Poll/Select, Flow Control–Stop-and-Wait, Sliding Window, Error Control–Stop-and-Wait ARQ, Sliding Window ARQ Go-Back-n ARQ, Selective-Reject ARQ.

Local Area Networks: Introduction to IEEE 802, Ethernet-CSMA/CD, Implementation, Token Ring,-Token Passing, Implementation.

Switching: Circuit Switching, Packet Switching, Message Switching.

Unit – III

Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Brouters, Switches, Distance Vector Routing Algorithm, Link State Routing Algorithm.

Transport Layer: Duties of Transport Layer, Connection.

Upper OSI Layers; Session Layer, Presentation Layer, Application Layer.

Text Behrouz A. Forouzan, *Data Communication and Networking (2e Update)*

References

S.S. Shinde, *Computer Networks*

William Stallings, *Data and Computer Communications*

Andrew S. Tanenbaum, David J Wetherall, *Computer Networks*

Behrouz A Forouzan, Firouz Mosharraf, *Computer Networks A Top-Down Approach*

James F. Kurose, Keith W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*

Networks Lab BS605

Practical 2 Hours/Week 1 credit

1. Write a program to create a socket and implement connect function.
2. Write a program to get MAC address.
3. Write a program to display hello world using signals.
4. Write a program for socket pair system call using IPC.
5. Write a program to implement the sliding window protocol.
6. Write a program to identify the category of IP address for a given IP address.
7. Write a program to print details of DNS host.
8. Write a program to implement listener and talker.
9. Write a program to implement TCP echo using client–server program.
10. Write a program to implement UDP echo using client–server program.
11. Write a UDP client–server program to convert lowercase letters to uppercase letters.
12. Write a TCP client–server program to convert a given string into reverse.
13. Write a UDP client–server program to convert a given string into reverse.
14. Write a program to implement TCP iterative client–server program.
15. Write a program to implement time service using TCP client–server program.
16. Write a program to implement time service using UDP client–server program.

Note : Write above program using C language on Unix/Linux systems.

DSE–1F PHP with MySQL BS606

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Introducing PHP – What is PHP? Why use PHP? Evolution of PHP, Installing PHP, Other ways to run PHP, Creating your first script. PHP Language Basics – Using variables, Understanding Data Types, Operators and Expressions, Constants. Decisions and Loops – Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping with HTML.
Strings – Creating and Accessing Strings, Searching Strings, Replacing Text with Strings, Dealing with Upper and Lowercase, Formatting Strings. Arrays – Creating Arrays, Accessing Array Elements, Looping Through Arrays with for-each, Working with Multidimensional Arrays, Manipulating Arrays.

Unit – II

Functions – What is a Function? Why Functions are useful? Calling Functions, Working with Variable Functions, Writing your own Functions, Working with References, Writing Recursive Functions.
Objects – Introduction OOP Concepts, Creating Classes and Objects in PHP, Creating and using Properties, Working with Methods, Object Overloading with _get(), _set() and _call(), Using Inheritance to Extend Power of Objects, Constructors and Destructors, Automatically Loading Class Files, Storing as Strings.
Handling HTML Forms with PHP – How HTML form works, Capturing Form Data with PHP, Dealing with Multi-Value Fields, Generating Web Forms with PHP, Storing PHP Variables in Forms, Creating File Upload Forms, Redirecting After a Form Submission.

Unit – III

Working with Files and Directories - Getting Information on Files, Opening and Closing Files, Reading and Writing to Files, Copying, Renaming, and Deleting Files, Working with Directories.
Introducing Databases and SQL – Deciding How to Store Data, Understanding Relational Databases, Setting Up MySQL, A Quick Play with MySQL, Connecting MySQL from PHP.
Retrieving Data from MySQL with PHP – Setting Up the Book Club Database, Retrieving Data with SELECT, Creating a Member Record Viewer. Manipulating MySQL Data with PHP – Inserting, Updating, and Deleting Records, Building a Member Registration Application.

Text

Matt Doyle, *Beginning PHP 5.3* (Wrox – Wiley Publishing)

References

Ellie Quigley, *PHP and MySQL by Example*
Joel Murach, Ray Harris, *Murach's PHP and MySQL*
Brett McLaughlin, *PHP & MySQL: The Missing Manual*
Luke Welling, Laura Thomson, *PHP and MySQL Web Development*
W. Jason Gilmore, *Beginning PHP and MySQL From Novice to Professional*
Andrew Curioso, Ronald Bradford, Patrick Galbraith, *Expert PHP and MySQL*

PHP with MySQL Lab BS606

Practical 2 Hours/Week 1 credit

1	a) Write a PHP script to find the factorial of a given number. b) Write a PHP script to find the sum of digits of a given number.
2	a) Write a PHP script to find whether the given number is a prime or not. b) Write a PHP script to demonstrate the use of break, continue statements using nested loops.
3	a) Write a PHP script to display the Fibonacci sequence with HTML page. b) Write a PHP script to create a chess board.
4	a) Write a PHP script using built-in string function like strstr(), strops(), substr_count(), etc... b) Write a PHP script to transform a string to uppercase, lowercase letters, make a string's first character uppercase.
5	a) Write a PHP script that inserts a new item in an array in any position. b) Write a PHP function to check whether all array values are strings or not.
6	a) Write a PHP script to count number of elements in an array and display a range of array elements. b) Write a PHP script to sort a multi-dimensional array set by a specific key.
7	a) Write a PHP script using a function to display the entered string in reverse. b) Write a PHP script using function for sorting words in a block of text by length.
8	a) Write a PHP script for creating the Fibonacci sequence with recursive function. b) Write a PHP script using pass by value and pass by reference mechanisms in passing arguments to functions.
9	a) Write a PHP script to demonstrate the defining and using object properties. b) Write a PHP script to demonstrate the inheritance.
10	a) Write a PHP script to demonstrate the object overloading with _get(), _set(), and _call(). b) Write a PHP script to demonstrate the overloading property accesses with _get() and _set().
11	a) Write a PHP script to demonstrate the method overloading and method overriding mechanisms. b) Write a PHP script to demonstrate the use of final classes and final methods.
12	a) Write a PHP script to demonstrate the use interfaces. b) Write a PHP script using constructors and destructors.
13	Write a PHP application to handling HTML forms with PHP script.
14	a) Write a PHP script to create a file, write data into file and display the file's data. b) Write a PHP script to check and change file permissions, copying, renaming and deleting files.
15	a) Write a PHP application for connecting to MySQL and reading data from database table. b) Write a PHP application for inserting, updating, deleting records in the database table.
16	Write a PHP application for student registration form.

DSE–2F Web Technologies BS606

Theory	3 Hours/Week	3 credits
Practical	2 Hours/Week	1 credit

Unit – I

Structuring Documents for the Web: Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Phrase Elements, Lists, Editing Text, Core Elements and Attributes, Attribute Groups
Links and Navigation: Basic Links, Creating Links with the <a> Element, Advanced E- mail Links.
Images, Audio, and Video: Adding Images Using the <img> Element, Using Images as Links Image Maps, Choosing the Right Image Format, Adding Flash, Video and Audio to your web pages.
Tables: Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables
Forms: Introducing Forms, Form Controls, Sending Form Data to the Server
Frames: Introducing Frameset, <frame> Element, Creating Links Between Frames, Setting a Default Target Frame Using <base> Element, Nested Framesets, Inline or Floating Frames with <iframe>.

Unit – II

Cascading Style Sheets: Introducing CSS, Where you can Add CSS Rules.
CSS Properties: Controlling Text, Text Formatting, Text Pseudo Classes, Selectors, Lengths, Introducing the Box Model.
More Cascading Style Sheets: Links, Lists, Tables, Outlines, The :focus and :activate Pseudo classes Generated Content, Miscellaneous Properties, Additional Rules, Positioning and Layout with CSS
Page Layout: Understating the Site's Audience, Page Size, Designing Pages, Coding your Design, Developing for Mobile Devices.
Design Issues: Typography, Navigation, Tables, Forms.

Unit – III

Learning JavaScript: How to Add Script to Your Pages, the Document Object Model, Variables, Operators, Functions, Control Statements, Looping, Events, Built- In Objects,
Working with JavaScript: Practical Tips for Writing Scripts, Form Validation, Form Enhancements, JavaScript Libraries.
Putting Your site on the web: Meta tags, Testing your site, Talking the Leap to Live, Telling the World about your site, Understanding your visitors.

Text

Jon Duckett, *Beginning HTML, XTML, CSS and JavaScript*

References

Chris Bates, *Web Programming*
M. Srinivasan, *Web Technology: Theory and Practice*
Achyut S. Godbole, Atul Kahate, *Web Technologies*
Kogent Learning Solutions Inc, *Web Technologies Black Book*
Ralph Moseley and M. T. Savaliya, *Developing Web Applications*
P.J. Deitel & H.M. Deitel, *Internet and World Wide Web How to program*

Web Technologies Lab BS606

Practical 2 Hours/Week 1 credit

1	a. Write a HTML program using basic text formatting tags, <hn>, <p>,
	, <pre>.
	b. Write a HTML page for Example Cafe using above text formatting tags.

2	a. Write a HTML program using presentational element tags <b>, <i>, <strike>, <sup>, <sub>, <big>, <small>, <hr> b. Write a HTML program using phrase element tags <blockquote>, <cite>, <abbr>, <acronym>, <kbd>, <address>
3	a. Write a HTML program using different list types. b. Write a HTML page that displays ingredients and instructions to prepare a recipe.
4	a. Write a HTML program using grouping elements and . b. Write a HTML Menu page for Example cafe site.
5	a. Write a HTML program using images, audios, videos. b. Write a HTML program to create your time table.
6	Write a HTML program to create a form using text inputs, password inputs, multiple line text input, buttons, check boxes, radio buttons, select boxes, file select boxes.
7	Write a HTML program to create a frames and links between frames.
8	Write a HTML program to create different types of style sheets.
9	Write a HTML program to create CSS on links, lists, tables and generated content.
10	Write a HTML program to create your college web site using multi column layouts.
11	Write a HTML program to create your college web site using for mobile device.
12	Write a HTML program to create login form and verify username and password using DOM
13	a. Write a JavaScript program to calculate area of rectangle using function. b. Write a JavaScript program to wish good morning, good afternoon, good evening depending on the current time.
14	a. Write a JavaScript program using switch case?. b. Write a JavaScript program to print multiplication table of given number using loop.
15	a. Write a JavaScript programs using any 5 events. b. Write a JavaScript program using JavaScript built in objects.
16	Write a JavaScript program to create registration form and validate all fields using form validation