SIXTH SEMESTER

Sl. No.	Course Category	Subject Code	Subject Title	L	T	P	Contact Hours/ week	Credit	Full Marks
1.	Program Core-21	PC CS 601	Digital Image Processing	3	0	0	3	3	100
2.	Program Core-22	PC CS 602	Compiler Design	3	0	0	3	3	100
3.	Program Core-23	PC CS 603	Cryptography and Network Security	3	0	0	3	3	100
4.	Program Core-24	PC CS 604	Software Engineering	3	0	0	3	3	100
5.	Program Core-25	PC CS 605	Advanced Java Lab	0	0	2	2	1	100
6.	Program Core-26	PC CS 606	Web Technology Lab (PHP/ JavaScript)	0	0	2	2	1	100
7.	Program Core-27	PC CS 607	Image Processing Lab	0	0	2	2	1	100
8.	Program Elective-1	PE CS 608/1	Advanced Computer Architecture	3	0	0	3	3	100
		PE CS 608/2	Data Mining						
		PE CS 608/3	Web Technology						
9.	Project - 1	PR CS 609	Mini Project	0	0	6	6	3	100
Total :				15	0	12	27	21	900

Digital Image Processing

Course Code	PC CS 601
Course Title	Digital Image Processing
Prerequisites	Basic Knowledge of Mathematics and Signals
Course Category	Program Core-21
Number of classes	36 hours
Number of credits	03 (L: 3, T: 0, P: 0)

Course Outcome:

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

Course Outcomes(COs): At the end of the course, the student will be able to		
CO Number	CO Description	K-level
CO-1	Mathematically represent images and analyze different relationships and operations on them.	K2
CO-2	Utilize different techniques employed for the enhancement of images	K3
CO-3	Analyze various colour image models and restoration approaches.	K4
CO-4	Develop algorithms for image compression and coding.	K4

COURSE CONTENT

Module 1: Digital Image Fundamentals (8 lectures)

Digital Image Fundamentals-Elements of visual perception, image sensing and acquisition, image sampling and quantization, basic relationships between pixels – neighborhood, adjacency, connectivity, distance measures. Simple Operations- Arithmetic, Logical, Geometric Operations. Mathematical Preliminaries - 2D Linear Space Invariant Systems - 2D Convolution - Correlation 2D Random Sequence - 2D Spectrum

Module 2: Image Transforms and Enhancement (10 lectures)

Image Transforms: 2D Orthogonal and Unitary Transforms-Properties and Examples. 2D DFT-FFT – DCT - Hadamard Transform - Haar Transform - Slant Transform - KL Transform - Properties And Examples. Image Enhancement:- Histogram Equalization Technique- Point Processing-Spatial Filtering-In Space And Frequency - Nonlinear Filtering-Use Of Different Masks.

Module 3: Color Models and Image Restoration (8 lectures)

Color Image Processing-Color models–RGB, YUV, HSI; Color transformations– formulation, color complements, color slicing, tone and color corrections; Color image smoothing and sharpening; Color Segmentation.

Image Observation And Degradation Model, Circulant And Block Circulant Matrices and Its Application In Degradation Model - Algebraic Approach to Restoration- Inverse By Wiener Filtering - Generalized Inverse-SVD and Interactive Methods - Blind Deconvolution-Image Reconstruction From Projections.

Module 4: Image compression and Segmentation (10 lectures)

Redundancy and Compression Models -Loss Less And Lossy. Loss Less- Variable-Length, Huffman, Arithmetic Coding - Bit-Plane Coding, Loss Less Predictive Coding, Lossy Transform (DCT) Based Coding, JPEG Standard - Sub Band Coding, Image Segmentation: Edge Detection - Line Detection - Curve Detection - Edge Linking And Boundary Extraction, Boundary Representation, Region Representation and Segmentation, Morphology-Dilation, Erosion, Opening and Closing. Hit And Miss Algorithms Feature Analysis.

References / Suggested Learning Resources:

(i) R.C. Gonzalez and R.E. Woods, Digital Image Processing, Second Edition, Pearson Education 3rd edition 2008

(ii) Anil Kumar Jain, Fundamentals of Digital Image Processing, Prentice Hall of India.2nd edition 2004

(iii) Digital Image Processing, Kenneth R Castleman, Pearson Education,1995.

(iv) Digital Image Procesing, S. Jayaraman, S. Esakkirajan, T. Veerakumar, McGraw Hill Education ,2009. Pvt Ltd, NewDelhi

(v) www.nptel.ac.in

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Compiler Design

Course Code	PE CS 602
Course Title	Compiler Design
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	PC CS 04
Course Category	Program Elective-4
Number of classes	36 hours

Course Outcome:

After completing this course, the student should be able to-

CO Number	CO Description	K-level
CO-1	Infer the different stages in the process of compilation and identify different methods of lexical analysis	K2
CO-2	Identify synthesized and inherited attributes	K3
CO-3	Design top-down and bottom-up parsers and develop syntax directed translation schemes	K3
CO-4	Develop algorithms to generate code for a target machine	K4

Course Content:

Module 1: **(8 hours)**

Introduction to Compiling: Compilers, Analysis of the source program, The phases of the compiler, Cousins of the compiler.
Lexical Analysis: The role of the lexical analyzer, Tokens, Patterns, Lexemes, Input buffering, Specifications of a token, Recognition of a tokens, Finite automata, From a regular expression to an NFA, From a regular expression to NFA, From a regular expression to DFA, Design of a lexical analyzer generator (Lex).

Module 2: **(12 hours)**

Syntax Analysis: The role of a parser, Context free grammars, Writing a grammar, Top down Parsing, Non-recursive Predictive parsing (LL), Bottom up parsing, Handles, Viable prefixes, Operator precedence parsing, LR parsers (SLR, LALR), Parser generators (YACC). Error Recovery strategies for different parsing techniques.
Syntax directed translation: Syntax director definitions, Construction of syntax trees, Bottom-up evaluation of S attributed definitions, L attributed definitions, Bottom-up evaluation of inherited attributes.
Type checking: Type systems, Specification of a simple type checker, Equivalence of type expressions, Type conversions

Module 3: **(8 hours)**

Run time environments
Source language issues (Activation trees, Control stack, scope of declaration, Binding of names), Storage organization (Subdivision of run-time memory, Activation records), Storage allocation strategies, Parameter passing (call by value, call by reference, copy restore, call by name), Symbol tables, dynamic storage allocation techniques.

Module 4: **(8 hours)**

Intermediate code generation: Intermediate languages, Graphical representation, Three-address code, Implementation of three address statements (Quadruples, Triples, Indirect triples).
Code optimization: Introduction, Basic blocks & flow graphs, Transformation of basic blocks, Dag representation of basic blocks, The principle sources of optimization, Loops in flow graph, Peephole optimization.
Code generations: Issues in the design of code generator, a simple code generator, Register allocation & assignment.

References / Suggested Learning Resources:

1. Aho, Sethi, Ullman - "Compiler Principles, Techniques and Tools" - Pearson Education.
2. Holub - "Compiler Design in C" - PHI.

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Cryptography and Network Security

Course Code	PC CS 603
Course Title	Cryptography and Network Security
Number of Credits	03 (L: 3, T: 0, P: 0)
Prerequisites	Computer Network
Course Category	Program Core
Number of classes	36 hours

Course Outcome:

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

CO Number	CO Description	K-level
CO-1	Demonstrate security of the data over the network.	K2
CO-2	Utilize the concept of cipher	K3
CO-3	Implement various networking protocols on authentication	K2
CO-4	Apply the methods to protect any network from the threats in the world.	K4

Course Content:

Module 1: Introduction (8)

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, stenography, key range and key size, possible types of attacks.

Module 2: Ciphers (10)

Symmetric key Ciphers: Block Cipher principles & Algorithms (DES, AES, Blowfish), Differential and Linear Crypt analysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution.

Asymmetric key Ciphers: Principles of public key crypto systems, Algorithms (RSA, Diffie-Hellman, ECC), Key Distribution.

Module 3: Authentication (10)

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm.

Authentication Applications: Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.

Module 4: Applications (8)

E-Mail Security: Pretty Good Privacy, S/MIME

IP Security: IP security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, key management.
Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction Intruders, virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, Countermeasures, Firewall design principles, types of firewalls
Case Studies on Cryptography and security: Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual E lections

References / Suggested Learning Resources:

7. William Stallings, “Cryptography and Network Security,” 3rd ed, Pearson Education (Asia) Pte. Ltd./ Prentice Hall of India, 2003.
8. C. Kaufman, R. Perlman, and M. Speciner, "Network Security: Private Communication in a Public World,” 2nd ed, Pearson Education (Asia) Pte. Ltd., 2002.
9. B. Forouzan, “Cryptography & Network Security”, Tata McGraw-Hill.
10. Atul Kahate, “Cryptography and Network Security,” Tata McGraw-Hill, 2003.
11. Eric Maiwald, “Fundamentals of Network Security,” McGraw-Hill, 2003.

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Software Engineering

Course Code	PE CS 604
Course Title	Software Engineering
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	Nil
Course Category	Program Elective-4
Number of classes	36 hours

Course Outcome:

After completing this course, the student should be able to-

CO Number	CO Description	K-level
CO-1	Identify the scope and necessity of software engineering and apply appropriate principles and techniques	K2
CO-2	Develop, maintain and evaluate large-scale software systems.	K3
CO-3	Plan to work as an effective member or leader of software engineering teams.	K3
CO-4	Discover efficient, reliable, robust and cost-effective software solutions.	K4

Course Content:

Module 1: (8hours)

Overview of System Analysis & Design , Business System Concept, System Development Life Cycle, Waterfall Model , Spiral Model, Feasibility Analysis, Technical Feasibility, Cost- Benefit Analysis, COCOMO model.

Module 2: (10 hours)

System Design – Context diagram and DFD, Problem Partitioning, Top-Down And Bottom-Up design; Decision tree, decision table and structured English; Functional vs. Object- Oriented approach.
Coding & Documentation – Structured Programming, OO Programming, Information Hiding, Reuse, System Documentation.
Testing – Levels of Testing, Integration Testing, Test case Specification, Reliability Assessment, Validation & Verification. Metrics, Monitoring & Control.

Module 3: (8 hours)

Software Project Management – Project Scheduling, Staffing, Software Configuration Management, Quality Assurance, Project Monitoring.

Module 4: (10 hours)

Software Cost Estimation – underlying factors of critical concern, Risk Management, Metrics for estimating costs of software products – Function Points, software cost estimation – Expert judgment, Delphi cost estimation, Work break-down structure and Process breakdown structure, COCOMO and COCOMO-II.
Static and dynamic models, why modeling, UML diagrams: Class diagram, interaction diagram: collaboration diagram, sequence diagram, state chart diagram, activity diagram, implementation diagram.

References / Suggested Learning Resources:

1. Pressman, Software Engineering : A practitioner's approach– (TMH)
2. Pankaj Jalote, Software Engineering- (Wiley-India)
3. N.S. Gill, Software Engineering – (Khanna Publishing House)
4. Rajib Mall, Software Engineering- (PHI)
5. Agarwal and Agarwal, Software Engineering – (PHI)
6. Sommerville, Software Engineering – Pearson
7. Martin L. Shooman, Software Engineering – TMH

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Advanced Java Lab

Course Code	PC CS 605
Course Title	Advanced Java Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	PC CS 307 and PC CS406
Course Category	Program Core(PC)
Number of classes	24 hours

Course Outcome:-

Upon the successful completion of the course, students will be able to:

CO No	CO Description	K-level
CO1	Design and Develop Swing-based GUI components.	K3
CO2	Examine client/server applications using socket programming	K4
CO3	Develop distributed applications using RMI and component-based Java software using JavaBeans	K3
CO4	Explain server-side programs in the form of Servlets and enterprise applications.	K2/K4

List of Experiments (*Minimum 6 experiments are to be performed. Use of virtual laboratory to perform few experiments may be explored, if available****):***

1. Implementation of multithread application using Java.
2. Create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings.
3. Apply Event Handling on AWT and Swing components.
4. Implementation of Socket program for chat application.
5. Invoke the remote methods in an application using Remote Method Invocation(RMI)
6. Develop java Applet program to accept two numbers from user and output the sum, difference in the respective text boxes.
7. Servlet program to implement and demonstrate get () and post() methods (using HTTP Servlet class).
8. Session tracking for a hit count using Java Servlet.
9. Establishing Communication between Applet and Servlet.
10. Create three tier application using Servlet by incorporating Java Database Connectivity inside Servlet to save data in a table.
11. Creating Jakarta (formerly Java) Server Pages (JSP) program to implement attributes of directive tags.
12. Cookies and session management using Jakarta (formerly Java) Server Pages (JSP).
13. Create Model-View-Controller (MVC) application with Struts framework: using Servlet/JSP

14. Creating Stateless and Stateful Session Beans.
15. Enterprise JavaBeans (EJB) Application that demonstrates Entity Bean.
16. Enterprise JavaBeans (EJB) Application that demonstrates Session Bean.

Learning Resources

i. Text Books:

1. ElliotteRustyHarold,"JavaNetworkProgramming",O'Reillypublishers,2004
2. EdRoman, "MasteringEnterprise JavaBeans", JohnWiley&SonsInc.,2004.

ii. Reference Books:

1. Hortsmann& Cornell, "CORE JAVA 2 ADVANCED FEATURES, VOL II", PearsonEducation, 2002.
2. Patrick Naughton, "COMPLETE REFERENCE: JAVA2", Tata McGraw-Hill,2003.
3. Michael Morrison, The Complete IDIOT's, Guide to JAVA 2", Prentice Hall of India.

iii. Online resources

1. www.cs.rit.edu/~jmk/java707/lecnotes/lecnotes.html
2. http://www.inf.ed.ac.uk/teaching/courses/cs2/LectureNotes/CS2Bh/APJ/apj5.pdf
3. http://ebookmaterials.blogspot.in/2011/07/advanced-programming-in-java-lecturer.html
4. http://java.sun.com.

Web Technology Lab

Course Code	PC CS 606
Course Title	Web Technology Lab (LTP: 0:0:2, Credit: 1)
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	ES 208(Programming for Problem Solving Lab)
Course Category	Program Core(PC)
Number of classes	24 hours

Course Outcome:

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

CO No	CO Description	K-level
CO-1	Analyze and apply the HTML, CSS, XML, JavaScript and protocols to build websites.	K4
CO-2	Utilize JavaScript to create functional forms	K3
CO-3	Utilize XML to access information methodically	K3
CO-4	Utilize php and database connectivity to create dynamic website.	K3

List of Experiments (*Minimum 6 experiments are to be performed. Use of virtual laboratory to perform few experiments may be explored, if available****):***

1. To create a simple html file to demonstrate the use of different tags.
2. To create an html file to link to different html page which contains images, tables, and also link within a page.
3. To create a registration form as mentioned below.
4. To create an html file by applying the different styles using inline, external & internal style sheets.
5. To write a JavaScript program to define a user defined function for sorting the values in an array.
6. To create an html page to explain the use of various predefined functions in a string and math object in java script.
7. To create an html page to explain the use of various predefined functions in a array & Date object in JavaScript.
8. To create an html page to demonstrate exception handling in JavaScript.

9. To create a html registration form and to validate the form using JavaScript code.
10. To create a CD catalog using XML file.
11. To create external style sheet and using the style sheet in xml file.
12. To create a xml style sheet to display the data in the xml using html table.
13. To create a php program to demonstrate the different file handling methods.
14. To create a php program to demonstrate the different predefined function in array, Math, Data & Regular Expression.
15. Write a program to introduce file.
16. Write a program to show database connectivity.
17. Install WordPress.
18. Working with the plugins in WordPress.

References / Suggested Learning Resources:

1. Deitel&Deitel, Internet and World Wide Web How to Program, Pearson education, 3e ,(2005)
2. HTML & XHTML: The Complete Reference, Thomas A. Powell, McGraw Hill
3. Learning Perl, by R.L. Schwartz, B.D Foy, T. Phoenix, O'Reilly
4. Perl Black Book, by Steven Holzner, DreamTech
5. Learning PHP, MySQL & JavaScript with j Query, CSS & HTML5, by Robin Nixon, O'Reilly
6. JavaScript: The Good Parts, O'Reilly

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Digital Image Processing Lab

Course Code	PC CS 607
Course Title	Digital Image Processing Lab
Prerequisites	Theoretical knowledge of Digital Image Processing
Course Category	Program Core-27
Number of classes	24 hours
Number of credits	01 (L: 0, T: 0, P: 4)

Course Outcome:

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

Course Outcomes(COs): At the end of the course, the student will be able to		
CO Number	CO Description	K-level
CO-1	Illustrate and execute basic commands in working environment/tool.	K3
CO-2	Explain discrete transform works including concepts of basic images.	K2
CO-3	Apply de-noising and restoration techniques.	K3
CO-4	Apply binary image processing operations	K3

List of Experiments (*Minimum 6 experiments are to be performed. Use of virtual laboratory to perform few experiments may be explored, if available****):***

1. Familiarize the working environment/tool.

2. Digital Signal Processing Basics

3. Image Enhancement

4. Image Segmentation

5. Image Restoration and Denoising

6. Binary Image Processing

Laboratory softwares / programming languages which may be used

MATLAB/ GNU Octave 3.8 or higher/ Scilab 5.5 or higher/ Choice of any open-source tool with the prior permission obtained from the department./ Python

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Advanced Computer Architecture

Course Code	PE CS 608/1
Course Title	Advanced Computer Architecture
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	PC CS404
Course Category	Program Core (PC)
Number of classes	38 hours

Course Outcome:

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

CO Number	CO Description	K-level
CO-1	Demonstrate concepts of parallelism in hardware/software	K3
CO-2	Identify memory organization and mapping techniques	K3
CO-3	Classify architectural features of advanced processors and Interpret performance of different pipelined processors	K4
CO-4	Explain data flow in arithmetic algorithms	K4

Course Content:

Module 1 **(8 Hours)**

PARALLEL COMPUTER MODELS: Evolution of Computer architecture, system attributes to performance, Multi processors and multi computers, Multi-vector and SIMD computers, PRAM and VLSI models-Parallelism in Programming, conditions for Parallelism-Program Partitioning and Scheduling-program flow Mechanisms-Speed up performance laws-Amdahl‘s law, Gustafson‘s law-Memory bounded speedup Model.

Module 2 **(10 Hours)**

MEMORY SYSTEMS AND BUSES: Memory hierarchy-cache and shared memory concepts-Cache memory organization-cache addressing models, Aliasing problem in cache, cache memory mapping techniques-Shared memory organization-Interleaved memory organization, Lower order interleaving, Higher order interleaving. Back-plane bus systems-Bus addressing, arbitration and transaction.

ADVANCED PROCESSORS: Instruction set architectures-CISC and RISC scalar processors-Super scalar processors-VLIW architecture- Multivector and SIMD computers-Vector processing principles-Cray Y-MP 816 system-Inter processor communication

Module 3 **(10 Hours)**

MULTI PROCESSOR AND MULTI COMPUTERS: Multiprocessor system interconnects-Cross bar switch, Multiport Memory-Hot spot problem, Message passing mechanisms-Pipelined processors-Linear pipeline, on linear pipeline Instruction pipeline design-Arithmetic pipeline design.

Module 4: **(10 Hours)**

DATA FLOW COMPUTERS AND VLSI COMPUTATIONS: Data flow computer architectures-Static, Dynamic-VLSI Computing Structures-Systolic array architecture, mapping algorithms into systolic arrays, Reconfigurable processor array-VLSI matrix arithmetic processors-VLSI arithmetic models, partitioned matrix algorithms, matrix arithmetic pipelines.

Suggested books:

1. Computer Architecture and Parallel Processing- Kai Hwang and A. Brigggs International Edition, McGraw Hill.

2. Advanced Computer Architecture: D. Sima, T. fountain, P. Kacsuk, Pearson

3. Parallel Computer Architecture: D. Culler, J.P. Singh, A. Gupta, Elsevier

Suggested reference books:

1. Computer Organization and Architecture, William Stallings,8th edition,PHI

2. Computer Organization, Carl Hamachar, Vranesic, Zaky, 5th edition, McGraw Hill.

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Data Mining

Course Code	PC CS 608/2
Course Title	Physics
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	DBMS
Course Category	Elective
Number of classes	36 hours

Course Outcome:

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

CO Number	CO Description	K-level
CO-1	Illustrate stages in building a Data Warehouse.	K2
CO-2	Design and develop business intelligence application.	K3
CO-3	Analyze and evaluate performance of algorithms for classification and prediction	K4
CO-4	Analyze clustering algorithms	K4

Course Content:

Module 1: Data Warehouse and OLAP Technology (10)

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.

Module 2: Data Mining (10)

Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining. Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation

Module 3: Classification and Prediction (8)

Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

Module 4: Cluster Analysis (8)

Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

References / Suggested Learning Resources:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition, 2006.

2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

3. Data Mining Techniques – Arun K Pujari, 2nd edition, Universities Press.

4. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson Edn Asia.

5. Insight into Data Mining, K.P.Soman, S.Diwakar, V.Ajay, PHI, 2008.

Web Technology

Course Code	PC CS 608/3
Course Title	Web Technology
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	ES 204 (Programming for Problem Solving)
Course Category	Program Core(PC)
Number of classes	36 hours

Course Outcome:-

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

CO No	CO Description	K-level
CO-1	Apply different HTML tags and CSS to build a website.	K3
CO-2	Utilize JavaScript to ensure validation and use XML to access information.	K3
CO-3	Explain the working of PHP along with form handling.	K4
CO-4	Explain the file handling and database accessibility using PHP.	K4

Course Content:-

Module- 1: HTML and CSS(8)

Web Programming Introduction, **HTML:** HTML-Introduction, Basic Formatting Tags, Grouping Using Div Span, Lists, Images, Hyperlink, Table, frames, **HTML-Headers:** Title, Base, Link, Styles, Script, Meta, **CSS:**CSS-Introduction, CSS Syntax, CSS Selectors, CSS Color Background Cursor, CSS Text Fonts, CSS Lists Tables, CSS Box Model, CSS Display Positioning.

Module- 2: JavaScript and XML(8)

JavaScript: Introduction to JavaScript, JavaScript language – declaring variables, scope of variables functions, event handlers (on click, on submit etc.), Document Object Model, Form validations. Simple AJAX applications. **XML:** Introduction to XML, Defining XML tags, their attributes and values, Document type definition, XML Schemas, Document Object model, XHTML, Parsing XML Data - DOM and SAX parsers in java.

Module- 3: Introduction to PHP and handling Forms (10)

PHP programming: Introduction to PHP: Evaluation of Php, Basic Syntax, defining variable and constant, Php Data type, Operator and Expression, Doing Repetitive task with looping, Mixing

Decisions and looping with Html. Define a function, call by value and Call by reference, Recursive function, String Creating and accessing, String Searching & Replacing String, Formatting String, String Related Library function. Looping with Index based array, looping with associative array using each () and for each(), Some useful Library function. **Handling Html Form with Php:** Capturing Form, Data Dealing with Multi-value filed, and Generating File uploaded form, redirecting a form after submission.

Module- 4: PHP files, database and Content Management System (CMS)(10)

Working with file and Directories: Understanding file& directory, Opening and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading & Downloading. **Session and Cookie:** Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session. **Database Connectivity with MySQL**: Introduction to RDBMS, Connection with MySQL Database, performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing query- Join (Cross joins, Inner joins, Outer Joins, Self joins. **Exception Handling:**Understanding Exception and error, Try, catch, throw, **CMS:**Introduction to CMS, Introduction to WordPress.

References/ Suggested Learning Resources: -

1. Learning PHP, MySQL, books by ' O' riley Press.
2. Java Script, D.Flanagan, O'Reilly, SPD.
3. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dremtech
4. XML: The Complete Reference, Heather Williamson, TATA McGraw-HILL.
5. XML: The Complete Reference, Thomas A. Powell, McGraw-HILL.
6. Head First Python, By Paul barry, O'Reilly.
7. Head First Ajax, By Rebecca M. Riordan, O'Reilly.
8. Head First WordPress, Jeff Siarto, O'Reilly.

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Mini Project

Course Code	PR CS 609
Course Title	Mini Project
Number of Credits	3 (L: 0, T: 0, P: 6)
Prerequisites	Nil
Course Category	Project(PR)
Number of classes	70 hours

Course Outcome:-

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

CO Number	CO Description	K-level
CO-1	Demonstrate a through and systematic understanding of project contents	K2
CO-2	Identify the methodologies and professional way of documentation and communication	K3
CO-3	Illustrate the key stages in development of the project	K2
CO-4	Develop the skill of working in a Team	K3
CO-5	Apply the idea of mini project for developing systematic work plan in major project	K3

Course Content:-

The miniproject topic should be selected / chosen to ensure the satisfaction of the urgent need to establish a direct link between education, national development and productivity and thus reduce the gap between the world of work and the world of study. The course should have the following-

1) Perform detailed study about various components of a project.
2) Study about methodologies and professional way of documentation and communication related to project work.
3) Develop idea about problem formulation.
4) Knowledge of how to organize, scope, plan, do and act within a project thesis.
5) Familiarity with specific tools (i.e. hardware equipment and software) relevant to the project selected.
6) Demonstrate the implementation of a mini project work.

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