SEMESTER - I

Core Paper – 1

ADVANCED COMPUTER ARCHITECTURE

Instructional Hrs: 60 **Sub. Code: 15CSPC101**

Max.Marks: CIA-25; ESE-75 **Credits: 4**

Objective: To enable the students to learn about parallel processing and gain knowledge about problem solving skills using parallel algorithms.

UNIT I **12 Hrs.**

Introduction to parallel processing: Evolution of Computer Systems– Parallelism in uniprocessor Systems – Parallel Computer structures – Architectural Classification schemes – Flynn' Classification – Feng's Classification – Handler's Classification – *Parallel Processing Applications.*

UNIT II **12 Hrs.**

Principles of Pipelining and Vector Processing: Pipelining: An Overlaped Parallelism – Principles of Designing Pipelined Processors - Instruction Prefetch and Branch Handling - Data Buffering and Busing structure – Internal forwarding and Register Tagging – Hazard Detection and Resolution – Job Sequencing and Collision Prevention – Vector processing requirements - *Characteristics* –Pipelined Vector Processing methods.

UNIT III **12 Hrs.**

Solving Problems in Parallel: Utilizing Temporal Parallelism – Utilizing Data Parallelism – Comparison of Temporal and Data Parallel Processing – Data parallel Processing with Specialized Processor – Inter-task Dependency. **Instructional Level Parallel Processing:** Pipelining of Processing Elements – Delays in Pipeline Execution – *Difficulties in Pipelining.*

UNIT IV **12 Hrs.**

Structure of Parallel Computers: A Generalized Structure of Parallel Computers-Classification of parallel Computers- Vector Computers- A Typical Vector Supercomputers- Vector Computer on a CHIP-IRAM- Array Processors- Shared memory Parallel Computers.

UNIT V **12 Hrs.**

Parallel Algorithms: Models of computation – Analysis of Parallel Algorithms Prefix Computation – Sorting – Searching – Matrix Operations – *Practical Models of Parallel Computation*.

Note: Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Kai Hwang, Faye A. Briggs**, *Computer Architecture and Parallel Processing* Mc Graw – Hill Book Company, 1985.
2. **V. Rajaraman, C. Siva Ram Murthy**, *Parallel Computers Architectures and Programming*, PHI, 2012.

REFERENCE BOOKS

1. **Michael J. Quinn**, *Parallel Computing Theory and Practice*, TMCH, Second Edition, 2002.
2. **Barry Wilkinson, Micheal Allen**, *Parallel Programming: Techniques and Applications*, Prentice Hall, 1999.

SEMESTER – I

Core Paper - III

ADVANCED SOFTWARE ENGINEERING

Instructional Hrs: 60 **Sub. Code: 15CSPC103**

Max.Marks: CIA-25; ESE-75 **Credits: 4**

Objective: To help students to develop skills that will enable them to construct software of high quality that is reliable and reasonably easy to understand, modify and maintain.

UNIT I **12 Hrs.**

Introduction to Software Engineering : The evolving role of software – The changing nature of software . A Generic View of Process – Process Models – Agile Process Models – Software Engineering practice- *planning and modeling practice*.

UNIT II **12 Hrs.**

Requirement Engineering: Requirement Engineering tasks - Initiating the Process -Eliciting Requirements- *Developing Use Cases* - Negotiating Requirements -Validating Requirements – Building the Analysis Models:Data Modeling Concepts-Flow-Oriented Modeling-Class-Based Modeling.

UNIT III **12 Hrs.**

Design Engineering: Design Process-Design Concepts – Design Models – Pattern Based Design – Software Architectural – *Data Design* – Component – Designing class based components.

UNIT IV **12 Hrs.**

Testing Strategies: Software Testing Strategies -Strategic Issues -Test Strategies for conventional software -Strategies for object oriented software - Validation testing -System testing – . **Testing Tactics**: Testing Fundamentals – Black Box – White Box –Basis Path-Control Structure.

UNIT V **12 Hrs.**

SCM and Quality Assurance: Product Metrics. Estimation: Empirical Estimation models – Risk Management – Quality Management: Concepts-SQA-Software Reviews-Formal Technical Reviews-Statistical Software Quality Assurance – Change Management -Software Configuration Management-*The SCM Process*.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Roger S. Pressman, *Software Engineering – A practitioner's Approach*, Sixth Edition, 2007.

REFERENCE BOOKS

1**. Carlo Ghezzi, Mehdi Jazayari, Dio Mandrioli,** *Fundamentals of Software Engineering*, Prentice Hall of India 1991**.**

2. **Fleeger.p,** *Software Engineering*, Prentice Hall, 1999**.**

3. **Sommerville,** *Software Engineering*, Addison Wesley, 5th Edition 1996.

SEMESTER – II

Core Paper – VI

ADVANCED JAVA

Instructional Hrs: 90 **Sub.Code: 15CSPC206**

Max.Marks: CIA-25; ESS-75 **Credits: 5**

Objective: To make the students understand the advanced concepts of JAVA.

UNIT I **12 Hrs.**

Introducing Classes – A closer look at methods and classes – Inheritance.

UNIT II **12 Hrs.**

Packages and interfaces – Multithreading – I/O, Applets and other Topics .

UNIT III **12 Hrs.**

Applet Class – Event handling – *Introducing the AWT* : Working with windows, Graphics and Text.

UNIT IV **12 Hrs.**

Using AWT controls, Layout Managers, Menus – Introducing Swing.

UNIT V **12 Hrs.**

Introduction to Servlets: Why Servlets? – *Servlet Basics* – Servlet API Basics – Writing your first servlet – Running servlets. Database Access with JDBC: JDBC Architecture – Accessing a DataBase – Sample JDBC Servlet.

Note: Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Herbert Schildt**, *The complete Reference Java*. TMH New Delhi, Seventh Edition, Eleventh Reprint, 2010. (Unit I to IV)
2. **Dustin R.Gallaway**, *Inside Servlets server side programming for the Java Platform*, Pearson Edition, 2009. (Unit V)

REFERENCE BOOKS

1. **Herbert Schildt,** *Swing a Beginners Guide*, TMH Edition, Second Reprint 2009.
2. **R.Krishnamoorthy, S.Prabhu**, *Internet and Java Programming*, New Age International Private Ltd., NewDelhi, 2009.
3. **M.P.Bhave & S.A.Patekar**, *Programming with Java*, Pearson Education, First Edition, 2009.

SEMESTER -II

Practical II

JAVA PROGRAMMING LAB

Instructional Hrs: 75 **Sub.Code: 15CSPCP02**

Max. Marks: CIA -40; ESE -60 **Credits: 3**

Objective: To make the students understand the concepts of JAVA

Program using following Concepts:

1. Classes and objects
2. Inheritance
3. Packages
4. Interfaces
5. Multithreading
6. Applets
7. AWT controls
8. Event Handling
9. Menu
10. Layout Managers
11. Swing Controls and Trees
12. JDBC

SEMESTER – II

Core Paper –VII

DIGITAL IMAGE PROCESSING

Instructional Hrs: 90 **Sub.Code: 15CSPC207**

Max.Marks: CIA-25; ESE-75 **Credits: 5**

Objective : To make the students understand the basic concepts of digital image processing.

UNIT I **18 Hrs.**

Introduction: What is Digital Image Processing – the origin of DIP – Examples of fields that use DIP – Fundamentals Steps in DIP – Components of an Image Processing System. **Digital Image Fundamentals:** Elements of Visual Perception – Light and the Electromagnetic Spectrum – Image Sensing and Aacquisition – Image Sampling and Quantization – *Some Basic Relationship Between Pixels* – Linear& Nonlinear Operations.

UNIT II **18 Hrs.**

Intensity Transformations and Spatial Filtering: Background – Some Basic Intensity Transformations Functions – Histogram Processing – Fundamentals of Spatial Filtering – Smoothing Spatial Filters – Sharpening Spatial Filters – Combining Spatial Enhancement Methods.

UNIT III **18 Hrs.**

Image Restoration: A Model of the Image Degradation / Restoration Process – Noise Models – Restoration is the Process of Noise only – Spatial Filtering – Periodic Noise Reduction by Frequency Domain Filtering – Linear, Portion – Invariant Degradations – Estimating the Degradation Function – Inverse Filtering– Geometric Mean Filter.

UNIT IV **18 Hrs.**

Image Compression: Fundamentals. **Some Basic Compression Methods**: Huffman Coding – Arithmetic Coding – LZW Coding – Run-Length Coding – Bit-Plane Coding – Wavelet Coding. Digital Image Watermarking.

UNIT V **18 Hrs.**

Image Segmentation: Fundamentals – Point, Line, Edge Detection – Thresholding – Region – Based Segmentation – Segmentation by Morphological Watersheds.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

1. **Rafael C. Gonzalez, Richard E. Woods**, *Digital Image Processing*, PHI / Pearson Education, New Delhi, Third Edition, 2012.

REFERENCE BOOKS

1. **Chanda B, Dutta Majumder D**, *Digital Image Processing and Analysis*, PHI, New Delhi, 2003.
2. **Nick Efford**, *Digital Image Processing a practical introducing using Java*, Pearson Education, New Delhi, 2004.

SEMESTER III

Core Paper - IX

VB.NET PROGRAMMING

Instructional Hrs: 60 **Sub Code: 15CSPC309 / 15CAPC514**

Max.Marks: CIA-25; ESS-75 **Credits: 4**

Objective: To understand the structure of .NET Framework and to gain the practical working knowledge of the VB.NET.

UNIT I **12 Hrs.**

Essential VB .NET : What' New in VB.NET- Upgrading from VB 6.0- The .NET framework and CLR- Building VB.NET applications – The VB.NET IDE. **The VB language:** constants- variables- data types- arrays- strings-operators- conditionals- loops.

UNIT II **12 Hrs.**

Sub procedures- Functions - Scope - Structured exception handling- **Windows Forms:** Windows forms- adding controls to form MDI forms – Handling events- Mouse events- Keyboard events – Msg box- Input box. Text Boxes: Multiline-Word wrap-accessing-Rich text box: Accessing text- text Style- Labes: Formatting- Aligning

UNIT III **12 Hrs.**

Buttons: caption – color- handling button clicks - tab order Check box: Checkbox states-three states Radio buttons: states- toggle- List box: Adding, removing items – Index- events combo box: Simple- drop down – Drop down combo list – adding, removing items – current selection- sorting –clearing- number of items. Menus: creating menus – sub menus - context menus- Menu items- access keys- shortcut – separators Built in Dialog boxes : Open file dialog – save dialog – font dialog color dialog.

UNIT IV **12 Hrs.**

Data Access with ADO. NET : what are databases?- Accessing data with the server explorer – data adaptors and datasets- working with ADO.NET - ADO.NET objects – Using explorer – New data connection – creating a dataset – populating a dataset – displaying data in a data grid – data provider – data adapters – dataset properties- connecting MS Jet databases : Using data binding property -Simple binding – binding text boxes – binding check boxes – Complex data binding – binding combo boxes – binding listboxes - display member, value member properties – data grid class – data grid class- binding data grid

UNIT V **12 Hrs.**

Handling database in code: OleDbConnection class- sqlconnection class- oledbcommand class – sqlcommand class- dataadapter class – dbdataadapter class – oledbdatareader class – datatable class – datarow class- datacolumn class – datarelation class – creating dataset, connection, command object, data adapter – accessing individual data items – using data reader

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Steven Holzner, *Visual Basic .NET Programming*, Dreamtech Press, 2013.

REFERENCE BOOKS

1**. David I.Schneider**, *An Introduction to Programming using VB.NET*, First Edition, Prentice Hall of India Private Ltd., New Delhi.

2. **Vikas Gupta & Kogent Solutions Inc**, *Comdex .NET Programming Course Kit*, Dreamtech Press 2007.

SEMESTER - III

Core Paper – X

DATA MINING

Instructional Hrs: 75 **Sub. Code: 15CSPC310**

Max. Marks: CIA – 25; ESE – 75 **Credits: 5**

Objective: To enable the students to gain knowledge on Data Mining techniques.

UNIT I **15 Hrs.**

Introduction: Fundamentals of data mining – Data Mining functionalities – Classification of Data Mining – Task Primitives- Integration of a Data Mining system with a database or Data Warehouse system – Major Issues.

UNIT II **15 Hrs.**

Data Preprocessing: Need for Preprocessing – Descriptive Data Summarization - Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT III **15 Hrs.**

Classification and Prediction: Issues – Decision tree Induction – Bayesian classification – Back propagation – Support Vector machine. Prediction – Other classification methods. Prediction: Accuracy and error measure – Evaluating the accuracy of a classifier or predictor – Ensemble methods - Model selection.

UNIT IV **15 Hrs.**

Clustering Analysis: Cluster analysis Introduction - Types of data in cluster analysis-Hierarchical methods – Density-Based Method - Outlier Analysis – Mining Frequency Patterns, Associations, and Correlations: Efficient and Scalable Frequent Itemset Mining Methods - Mining Various Kind of Association Rules - Constraint-Based Association Mining.

UNIT V **15 Hrs.**

Social Network Analysis - Spatial Data Mining – Text Mining – Mining the World Wide Web.

TEXT BOOK

Jiawei Han and Micheline Kamber, *Data Mining Concept and Techniques*, Morgan Kaufmann Publishers, Second Edition, 2008.

REFERENCE BOOKS

1. **Arun K. Pujari**, Data Mining Techniques, Universities Press (India) Pvt. Ltd., Third Edition, 2013.
2. **Margaret H. Dunhan**, Data Mining : Introductory and Advanced Topics, Pearson Education, 2013.

SEMESTER – III

Practical III

VB.NET PROGRAMMING LAB

Instructional Hrs: 75 **Sub.Code: 15CSPCP04/ 15CAPCP09**

Max. Marks: CIA-40; ESE -60 **Credits: 3**

Objective: To make the students understand the concepts of Software Project using .NET &UML.

1. Create a simple application using controls (Any one of Calculator or Drawing Pictures using GDI)
2. Preparation of Electricity Bill.
3. Develop an application for Inventory.
4. Develop an application for Employee Payroll System.
5. Develop an application for Student Information System.
6. Develop an application for Library Management System.