

Unit 8. Controlling, Extending and Embedding Perl**5 Hrs.**

Warning, The strict Pragma, Other Perl Pragmas, Perl Internals, Perl's Internal Structures, Extending Perl, Embedding Perl, Cooperating with other languages.

Unit 9. Debugging, Tuning, Compiling, Documenting, and Distributing 5 Hrs.

Debugging techniques, Using a debugger, Traps for programmers of other languages, Optimization, Using dump, Using the compiler, Comparing script and executable speeds, Using the supplied documentation, Writing POD documentation, Converting POD to other formats, Function support, Perl makefiles.

Laboratory works: Exercises covering all features of above.

Text / Reference book:

1. The Complete Reference: Perl, Martin C. Brown, Tata McGraw-Hill Publishing Company Limited, 2001.

Course Title: Net Centric Computing

Course no: Csc-360

Credit hours: 3

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Full Marks: 70+10+20

Pass Marks: 28+4+8

Course Synopsis: This course explores the concepts of developing web technology.

Goal: To provide the knowledge of Web Centric Computing Using Active Server programming.

Course Contents:

Unit 1. Introduction

4 Hrs.

Behind the scenes: Introduction, benefit and application of ASP; Introduction to IIS: Features, properties and application of IIS and MMC, Virtual directory properties; ASP requirements: Need for ASP, Scripting capabilities, Recognizing individuals, Database access, State maintenance, ASP extensibility.

Unit 2. Intrinsic ASP Objects

6 Hrs.

The response object: ASP objects, Sending text with the response object and embedded quotes, Using variables, Other response; The request object; The application and server objects: Threads, Application variables and use, The server object, Limitation of application variables; The session object.

Unit 3. Writing Server-Side Code

8 Hrs.

Coding using VBScript and JScript, The scripting dictionary object, File access with ASP, Debugging ASP and error-handling.

Unit 4. Using Components

5 Hrs.

The browser capabilities component: Difference between browser, Components properties/methods, working and capabilities; Other ASP components; Sending and receiving E-mail with ASP.

Unit 5. Accessing Databases with ASP and ADO

7 Hrs.

Introduction to relational databases and SQL, Introduction to ADO, Accessing data with ADO, Controlling transactions in ASP.

Unit 6. ASP Applications

7 Hrs.

Introduction to ASP applications, State maintenance in ASP applications, Controlling access and monitoring, Planning application, Develop a sample project using ASP.

Unit 7. Advanced ASP

8 Hrs.

Client-side scripting, Building own components, Automating active server pages, Efficiency and scalability.

Laboratory works: Exercises covering all features of above.

Text / Reference Book: Active Server Pages 3, a Russell Jones, BPB Publications, New Delhi, 2003.

Course Title: Embedded System Programming

Course no: CSC-362

Credit hours: 3

Full Marks: 70+10+20

Pass Marks: 28+4+8

Nature of course: Theory (3 Hours) + Lab (3 Hrs.)

Course Synopsis: This course explores the system integration and its issues.

Goal: To allow the student to study the design and development process for dedicated computer systems in relation to the environment in which they operate.

Unit 1. Introduction:

8 Hrs.

Overview of dedicated and automated systems and their specific requirements (robust design, environmental issues, temporal constraints, technological constraints, software systems); the product design cycle.

Unit 2. System Specification and Integration:

12 Hrs.

Development of a system specification, including case studies, Evaluation and justification of the available levels of system integration (custom chipdesign through to turnkey-systems) and technological choice.

Unit 3. Software Issues:

11 Hrs.

Development environment: compilers, linkers, debuggers, emulators, real time operating systems and kernels, Designing and implementing code for dedicated systems

Unit 4. Hardware Issues:

14 Hrs.

Choice of processor: I/O, memory, speed, integration, development facilities, economics; DSP devices, Interfacing to commonly used peripheral devices, Backplane Bus standards, Transducers: sensors for measuring physical phenomena, output devices such as power actuators and motors, Data transformation, signal conditioning and data conversion. The impact of EMC regulations on design practice.

Laboratory works: The laboratory exercises should cover all the features mentioned above.

Text / Reference books:

- 1 S Heath, **Embedded System Design**, Butterworth-Heinemann 1997, ISBN0-75063-237-2
- 2 David E. Simon, **An Embedded Software Primer**, Pearson Education, 2001

Course Title: Image Processing

Course no: CSC-363

Credit hours: 3

Full Marks: 70+10+20

Pass Marks: 28+4+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: This course deals with image components.

Goal: To be familiar with processing of the images, recognition of the pattern and their applications.

Unit 1. Introduction to Digital Image Processing: 4 Hrs.

Digital image representation, Digital image processing: Problems and applications, Elements of visual perception, Sampling and quantization, relationships between pixels

Unit 2. Two-dimensional Systems: 5 Hrs.

Fourier transform and Fast Fourier Transform, Other image transforms and their properties: Cosine transform, Sine transform, Hadamard transform, Haar transform

Unit 3. Image Enhancement and Restoration: 8 Hrs.

Point operations, contrast stretching, clipping and thresholding, digital negative, intensity level slicing, bit extraction, Histogram modeling: Equalization modification, specification, Spatial operations: Averaging, directional smoothing, median, filtering spatial low pass, high pass and band pass filtering, magnification by replication and interpolation

Unit 4. Image Coding and Compression: 4 Hrs.

Pixel coding: run length, bit plan, Predictive and inter-frame coding

Unit 5. Introduction to Pattern Recognition and Images: 3 Hrs.

Unit 6. Recognition and Classification: 5 Hrs.

Recognition classification, Feature extraction, Models, Division of sample space

Unit 7. Grey Level Features Edges and Lines: 6 Hrs.

Similarity and correlation, Template matching, Edge detection using templates, Edge detection using gradient models, model fitting, Line detection, problems with feature detectors

Unit 8. Segmentation: 3 Hrs.

Segmentation by thresholding, Regions for edges, line and curve detection

Unit 9. Frequency Approach and Transform Domain: 3 Hrs.

Unit 10. Advanced Topics: 4 Hrs.

Neural networks and their application to pattern recognition, Hopfield nets, Hamming nets, perceptron

Laboratory works: Developing programs of above features.

Text / Reference books:

1. K. Castleman, "*Digital Image Processing*", Prentice Hall of India Ltd., 1996.
2. A. K. Jain, "*Fundamental of Digital Image Processing*", Prentice Hall of India Pvt. Ltd., 1995.
3. R. C. Gonzalez and P. Wintz, "*Digital Image Processing*", Addison-Wesley Publishing, 1987.
4. Sing_Tze Bow, M. Dekker, "*Pattern Recognition and Image Processing*", 1992
5. M. James, "*Pattern Recognition*", BSP professional books, 1987.
6. P. Monique and M. Dekker, "*Fundamentals of Pattern Recognition*", 1989.