S6 IT

PROJECT MANAGEMENT
T601 3+1+0

Module 1 PROJECT PLANNING
Overview – Capital expenditure - Phases of capital budgeting – Project development cycle – 7-s of project management – Requirements of a project manager – Forms of project organization.

Module 2 PROJECT ANALYSIS
Market Analysis – Technical Analysis - Financial Analysis – Risk Analysis – Social cost Benefit Analysis.

Module 3 CONTROL OF PROJECT
Control Systems – Control of major constraints – Project management software & information systems.
REVIEW: Performance of Evaluation – Abaudonment Analysis – Behavioral issues in Project Management

Module 4 TOTAL QUALITY MANAGEMENT
Quality systems – ISO 9000 series – ISI – Benchmarking – Quality Function development (QFD) – Total Productive Maintenance (TPM) – ISO 14000.

Module 5 CONCEPTS IN SAMPLING
Sampling designs and schemes – Errors in sampling – Simple random sample – stratified random sample – Cluster sample.
Sample size destination – Estimating population mean – Estimating population proportion.

References

Projects preparation, Apprisal, Budgeting & Implementation – Prasanna Chandra – Tata McGraw Hill
PROJECTS – Planning, Analysis, Selection, Implementation & Review - Prasanna Chandra – Tata McGraw Hill
Project Management - Harvey Maylor - Pearson Education
Total Quality Management – Dale H. Besterfield – Pearson Education
Quality control and Improvement – Amitava Mitra – Pearson Education
Quality assurance and TQM – Jain & Chitale – Khanna Publishers

SOFTWARE ENGINEERING
RT 602 2+1+ 0

Module 1 Introduction to Software engineering
Introduction – Software and software Engg.- Phases in software development-Software development process models-Role of Management in software development –Role of Matrics and measurement – Software requirement specification(SRS) - Problem Analysis - validation .

Module 2 Project Planning
Cost Estimation – Uncertainties – models – COCOMO model – Project scheduling – average duration estimation – Project scheduling and milestones – staffing and personal plan – Rayleigh curve – personnel plan – team structure – software configuration – management plans – quality assurance plans – verification and validation – inspections and reviews - project monitoring plans - time sheets – reviews – cost schedule – milestone graph – risk management.

Module 3 System Design
Design Principles – Problem partitioning and hierarchy – abstraction – modularity – top down and bottom_up – strategies – module level concepts - coupling - cohesion – structured design methodology - verification - matrics.

Module 4 Coding
Top-down and Bottom-up - Structured Programming - Information Hiding - Programming style - Internal Documentation – Verification - Code Reading - Static Analysis - Symbolic execution - Proving Correctness - Code inspections – Unit testing.

Module 5 Testing
Testing fundamentals - Functional and Structured Testing - Testing Process - Comparison of Verification and Validation Techniques - Reliability assessment - Programmer Productivity - Error removal efficiency.

Text Book

An integrated approach to Software Engineering - Pankaj Jalote, Narosa Publication

References

Software Engineering - Roger S. Pressman, Tata McGraw Hill
Software Engineering - Ian Sommervilla, Pearson Education
Software Engineering Theory and Practice- Shari Lawrence, Pearson Education Asia
Fundamentals of Software Engineering –Rajib Mall, PHI
Fundamentals of Software Engineering – Carlo Ghezzi, Mehdi Jazayeri, PHI

DIGITAL SIGNAL PROCESSING
LTA 603 3+1+0

Module1

Review of signals and systems. Introduction - advantages and limitations of Digital Signal Processing. Infinite Impulse Response (IIR) Filters - Signal Flowgraph- Basic Network structure for IIR filter- Direct- Cascade- Parallel Forms. Design of IIR Digital filters from analog filters- Butterworth design- Chebyshev design- design based on numerical solutions of differential equations- Impulse Invariant Transformation.

Module 2
Finite Impulse Response (FIR) Filters: Linear phase FIR filters- Frequency response of linear phase FIR filters - Location of the zeros of linear phase FIR filters. Realization of FIR- cascade - lattice design-Fourier Series method- using windows-rectangular- triangular or barlett windows- hanning- hamming- Blackman- Kaiser windows.

Module 3
Discrete fourier Transform: Properties-Circular convolution- Linear Convolution using DFT- relation between Z- Transform and DFT- Fast Fourier Transform; decimation – in time and Frequency - FFT algorithms – General Computation using Radix 2 algorithm.

Module 4
Finite word length effects in digital filters: Introduction- Number Representation - Fixed Point- Sign-Magnitude - One's-complement- Two's - complement forms -Addition of two fixed point numbers- Multiplication in Fixed Point arithmetic - Floating point numbers- Block floating point numbers- quantization - truncation- rounding - effects due to truncation and rounding- Input quantization error - Product quantization error - Co-efficient quantization error- zero-input limit cycle Oscillations - Overflow limit cycle Oscillations - Scaling- Quantization in Floating Point realization IIR digital filters - Finite Word Length Effects in FIR Digital Filters- Quantization effects in the Computation of the DFT- quantization errors in FFT algorithms.

Module 5
Applications of digital signal processing: Speech Processing- speech analysis- speech coding- sub band coding- channel vecoder- homomorphic vecoder- digital processing of audio signals- Radar signal processing- DSP based measurements systems. Equi ripple FIR design- PCM DSP chips- a general study.

References

Digital signal processing: Ifechor- Pearson edn.
Desecrate time signal processing Oppenhiem- Pearson edn.
Digital signal processing: Oppenhiem and Sheffer- PHI
Introduction to Digital signal processing: Johny R Johnson
Digital signal processing: Proakis and Manolakis.
Digital signal processing: P Ramesh Babu- Scitech Pub.
COMPUTER NETWORKS
RT 604 3+1+0

Module 1
Introduction: - ISO-OSI Reference Model – TCP/IP Reference Model – Comparison Network hardware-Repeaters, Routers, Bridges, Gateways, Hub, Cable Modem.
Physical Layer: - Transmission Media– ISDN system Architecture – Communication Satellites – geostationary satellites - Medium Earth Orbit Satellites- Low earth orbit satellites– Satellite v/s Fiber

Module 2
Data Link Layer: - Design issues-Error Detection and correction – Elementary Data link protocols-Sliding window protocols. .
LAN Protocols: - Static & Dynamic channel allocation in LAN's and WAN's, Multiple access protocols – ALOHA – Pure ALOHA – Slotted ALOHA – Carrier Sense Multiple Access protocols – persistent and non-persistent CSMA – CSMA with collision detection – IEEE 802.3 standards for LAN

Module 3
Network layer: -Virtual Circuits, Datagrams, Routing Algorithm – Optimality principle - Flooding - Flow Based Routing - Link state routing – Distance vector routing – Multicasting – Link state multicasting – Distance vector multicasting - Congestion Control Algorithms – General principles – Packet discarding – Choke packets - Congestion prevention policies – Traffic shaping – Leaky bucket algorithm – Flow specifications – jitter control

Module 4
Transport Layer: - Transport Service - Elements of transport protocols – Internet Transfer Protocols UDP and TCP – ATM – Principle characteristics.

Module 5
Application Layer: -Domain name system – DNS name space – Resource records – Name servers – operation of DNS - Electronic Mail – MIME
Mobile networks: - Mobile telephone systems, Bluetooth - Components – Error correction – Network topology – Piconet and scatternet – L2CAP layers – Communication in Bluetooth networks

References

Computer Networks (Fourth Edition): Andrew S.Tanenbaum, Pearson Education Asia/ PHI
An Introduction to computer networking: Kenneth C. Mansfield Jr., James L. Antonakos, Prentice-Hall India
Communication Networks: Leon, Garcia, Widjaja Tata McGraw Hill.
Computer Networks (Second Edition): Larry L Peterson & Bruce S Davie, (Harcourt India)
Computer Networking: James F Kurose & Keith W Ross, Pearson Education
Introduction to Data Communications and Networking: Behrouz, Forouzan, McGraw Hill
NETWORK COMPUTING
RT 605 3+1+0

Module 1
HTML Documents
Basic Tags for Font & Paragraph Formatting Lists, Tables, Frames, image Maps
Cascading Style Sheets
Style Element, Inline style sheets, Embedded style sheets, External Style sheets, CLASS Attribute, Absolute and relative positioning of elements, DIV & SPAN Tags.

Module 2
Dynamic HTML Pages
Client side scripting - Java Script – variables, Arithmetic operations – message boxes, Arrays, control statements, functions, event handling, document object model.
Dynamic updating of pages with JAVA Script.

Embedding ActiveX controls - using the structured graphics – ActiveX Control.

Module 3
Java programming – Features of Java, Creating & using classes in Java – Static classes – Inheritance – Final methods, variables and classes – Interfaces - Nested classes – Inner classes – Anonymous Inner classes – Exception handling – Creating & using exceptions, Multithreaded programs and thread synchronization, creating and using packages. Creating GUI with AWT and Swing – -JDK1.1 event model

Module 4
Network Programming with Java - Features of Java – Applets & Application – Life cycle of applets - Security features for applets - Inter applet communication – Threads & Thread synchronization – TCP/IP Programming with Java – Iterative & Concurrent servers. Datagrams, IP multicasting, RMI (Structure and Working of a simple RMI Program only)

Module 5
HTTP Protocol working – HTTP methods, GET, PUT, DELETE, POST, HEAD
Server side scripting – HTML Forms & CGI – GET & POST, Basic working of a CGI supported web server – Simple CGI program in C to validate user name & Password.
Email: Working of SMTP and POP protocols (Overview only).

Text Books

Module 1,2,5
Internet and World Wide Web – How to program - Deitel, Deitel & Nieto, Pearson Education Asia
HTML, DHTML, Java Script, Perl, CGI - Evan Bayross, BPB

Module 3,4,5
Java 2 Complete reference - Herbert, Schildt, Tata McGraw Hill
The Java Programming Language 3rd Edition - Arnold, Gosling, Holmes, Pearson Education Asia
Using Java 2 Platform - Joseph Weber, PHI
Computer Networks - Tenanbaum, PHI/ Pearson Education Asia

References

Unix Network Programming - Stevens W Richard, PHI
TCP/IP Protocol suite, 2/e - Behrouz A. Forouzan, TMH

PERSONAL COMPUTER HARDWARE
T 606 4+1+0

Module 1 Introduction to PC
Hardware components – study of motherboards –Different types of ports, slots and connectors-Add-on cards-Power supply– SMPS- function & operations.

Module 2 Storage Devices

Floppy – Floppy Disk Controller - Disk Physical specification & operations – Disk magnetic properties – Cylinders – Clusters – Hard disks – Hard disk drive operation – Magnetic data storage - Sectors – Disk formatting – partitioning - Hard disk features – Hard disk data transfer modes –Programmed I/O – Direct memory access – Ultra DMA – Data addressing – Standard CHS addressing – Extended CHS addressing – Logical Block Addressing.

Module 3 Optical Storage
CD ROM, CD Technology, Sector layout, CD-R, CD-RW, CDROM, drive specifications- data transfer rate – Access time – Constant linear velocity – constant angular velocity - Buffers – Interface – Magneto optical drives – WORM devices –DVD- RAID – Holographic storage.

Module 4 Memory Management in PC
Parity – ECC – Static & Dynamic RAM – Memory Addressing – Segmented addressing - 64 KB Limits – 640 KB barrier – Logical, segmented, virtual, linear and physical memory addresses – Extended and Expanded memory – Cache memory – Video memory – HMA - Flat memory model – Advanced memory technologies.

Module 5 Bus Structures
ISA, PCI, PCMCIA, AGP, USB, Hard Disk Interfaces – IDE, EIDE, ATA – Communication ports – Serial – Parallel port – Keyboard / Mouse Interface connectors.

References

PC Hardware Complete Reference - Craig Zacker & John Rourke, Tata McGraw Hill
Inside the PC (8th Edition) - Peter Norton, Techmedia Publications
The Indispensable PC Hardware Book - Messmer, Pearson Education
Troubleshooting and Repairing Your PC - Corey Candler, Wiley
Upgrading and repairing PC's (4th edition) - Scott Mueller, Pearson Education
IBM PC Assembly Language Programming - Abel, PHI
PC Upgrading Maintenance & Trouble shooting guide - Dr. S. K. Chauhan, Kataria

SYSTEMS PROGRAMMING LAB
T607 0+0+3

1. Symbol table construction
2. Single pass and two pass assembler.
3. Macro processor module binder (with limited Instruction set)
4. Lexical analyzer.
5. Bottom Up and Top Down Parser.
6. Code generation.
7. Generation of code for linkers & loaders.
8. Study on UNIX: UNIX Shell Programming, Basic exercises in Processor Management – concurrent processing – memory management – implementation of shared memory and semaphores for process synchronization – device management – dead lock handling, implementation of simple protocols

(Any experiment according to the syllabus of T 502 and RT 505 can be substituted.)

MINI PROJECT
T608 0+0+3
The aim of the mini project is to prepare the students for the final year project. The topic for the mini project should be simple as compared to the main project, but should cover all the aspects of a complete project.