

ANNA UNIVERSITY CHENNAI : : CHENNAI – 600 025

AFFILIATED INSTITUTIONS

B.TECH. (8 SEMESTER) INFORMATION TECHNOLOGY

CURRICULUM – R 2008

SEMESTER V

(Applicable to the students admitted from the Academic year 2008–2009 onwards)

CODE NO.	COURSE TITLE	L	T	P	C
THEORY					
IT2301	Java Programming	3	0	0	3
MG2452	Engineering Economics & Financial Accounting	3	0	0	3
CS2304	System Software	3	1	0	4
CS2302	Computer Networks	3	0	0	3
CS2403	Digital Signal Processing	3	0	0	3
IT2302	Information Theory and Coding	3	0	0	3
PRACTICAL					
CS2308	System Software Lab	0	0	3	2
IT2305	Java Programming Lab	0	0	3	2
GE2321	Communication Skills Lab	0	0	4	2
TOTAL		18	1	10	25

MG2452 ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING

L T P C

3 0 0 3

UNIT I INTRODUCTION 6

Managerial Economics - Relationship with other disciplines - Firms: Types, objectives and goals - Managerial decisions - Decision analysis.

UNIT II DEMAND & SUPPLY ANALYSIS 10

Demand - Types of demand - Determinants of demand - Demand function - Demand elasticity - Demand forecasting - Supply - Determinants of supply - Supply function - Supply elasticity.

UNIT III PRODUCTION AND COST ANALYSIS 10

Production function - Returns to scale - Production optimization - Least cost input - Isoquants - Managerial uses of production function.

Cost Concepts - Cost function – Types of Cost - Determinants of cost - Short run and Long run cost curves - Cost Output Decision - Estimation of Cost.

UNIT IV PRICING 9

Determinants of Price - Pricing under different objectives and different market structures - Price discrimination - Pricing methods in practice – role of Government in pricing control.

UNIT V FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT) 10

Balance sheet and related concepts - Profit & Loss Statement and related concepts - Financial Ratio Analysis - Cash flow analysis - Funds flow analysis - Comparative financial statements - Analysis & Interpretation of financial statements.

Investments - Risks and return evaluation of investment decision - Average rate of return - Payback Period - Net Present Value - Internal rate of return.

TOTAL= 45 PERIODS

TEXT BOOKS:

1. McGuigan, Moyer and Harris, 'Managerial Economics; Applications, Strategy and Tactics', Thomson South Western, 10th Edition, 2005.
2. Prasanna Chandra. 'Fundamentals of Financial Management', Tata Mcgraw Hill Publishing Ltd., 4th edition, 2005.

REFERENCES:

1. Samuelson. Paul A and Nordhaus W.D., 'Economics', Tata Mcgraw Hill Publishing Company Limited, New Delhi, 2004.
2. Paresh Shah, 'Basic Financial Accounting for Management', Oxford University Press, New Delhi, 2007.
3. Salvatore Dominick, 'Managerial Economics in a global economy'. Thomson South Western, 4th Edition, 2001.

AIM:

To have an understanding of foundations of design of assemblers, loaders, linkers, and macro processors.

OBJECTIVES:

- To understand the relationship between system software and machine architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro processors.
- To have an understanding of system software tools.

UNIT I INTRODUCTION 8

System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS 10

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine independent assembler features - Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers - Implementation example - MASM assembler.

UNIT III LOADERS AND LINKERS 9

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

UNIT IV MACRO PROCESSORS 9

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

UNIT V SYSTEM SOFTWARE TOOLS 9

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

L: 45, T: 15, TOTAL= 60 PERIODS

TEXT BOOK:

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, 3rd Edition, Pearson Education Asia, 2000.

REFERENCES:

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 1972.
3. John R. Levine, Linkers & Loaders – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.

CS2302

COMPUTER NETWORKS

L T P C

3 0 0 3

UNIT I

9

Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control

UNIT II

9

Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

UNIT III

9

Circuit switching vs. packet switching / Packet switched networks – IP – ARP – RARP – DHCP – ICMP – Queueing discipline – Routing algorithms – RIP – OSPF – Subnetting – CIDR – Interdomain routing – BGP – Ipv6 – Multicasting – Congestion avoidance in network layer

UNIT IV

9

UDP – TCP – Adaptive Flow Control – Adaptive Retransmission - Congestion control – Congestion avoidance – QoS

UNIT V

9

Email (SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security – PGP - SSH

TOTAL= 45 PERIODS

TEXT BOOK:

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Fourth Edition, Morgan Kauffmann Publishers Inc., 2009, Elsevier.

REFERENCES:

1. James F. Kuross, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Third Edition, Addison Wesley, 2004.
2. Nader F. Mir, "Computer and Communication Networks", Pearson Education, 2007
3. Comer, "Computer Networks and Internets with Internet Applications", Fourth Edition, Pearson Education, 2005.
4. Andrew S. Tanenbaum, "Computer Networks", Sixth Edition, 2003, PHI Learning.
5. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000

UNIT I SIGNALS AND SYSTEMS	9
Basic elements of DSP – concepts of frequency in Analog and Digital Signals – sampling theorem – Discrete – time signals, systems – Analysis of discrete time LTI systems – Z transform – Convolution (linear and circular) – Correlation.	
UNIT II FREQUENCY TRANSFORMATIONS	9
Introduction to DFT – Properties of DFT – Filtering methods based on DFT – FFT Algorithms Decimation – in – time Algorithms, Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering – DCT.	
UNIT III IIR FILTER DESIGN	9
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation	
UNIT IV FIR FILTER DESIGN	9
Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters	
UNIT V APPLICATIONS	9
Multirate signal processing – Speech compression – Adaptive filter – Musical sound processing – Image enhancement.	

TOTAL= 45 PERIODS

TEXT BOOKS:

1. John G. Proakis & Dimitris G.Manolakis, “Digital Signal Processing – Principles, Algorithms & Applications”, Fourth edition, Pearson education / Prentice Hall, 2007.
2. Emmanuel C..Ifeachor, & Barrie.W.Jervis, “Digital Signal Processing”, Second edition, Pearson Education / Prentice Hall, 2002.

REFERENCES:

1. Alan V.Oppenheim, Ronald W. Schafer & Hohn. R.Back, “Discrete Time Signal Processing”, Pearson Education.
2. Andreas Antoniou, “Digital Signal Processing”, Tata McGraw Hill.

UNIT I INFORMATION THEORY 9

Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH 9

Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT III SOURCE CODING: IMAGE AND VIDEO 9

Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

UNIT IV ERROR CONTROL CODING: BLOCK CODES 9

Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder - CRC

UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES 9

Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

TOTAL= 45 PERIODS**TEXT BOOKS:**

1. R Bose, "Information Theory, Coding and Crptography", TMH 2007
2. Fred Halsall, "Multimedia Communications: Applications, Networks, Protocols and Standards", Perason Education Asia, 2002

REFERENCES:

1. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 2006
2. S Gravano, "Introduction to Error Control Codes", Oxford University Press 2007
3. Amitabha Bhattacharya, "Digital Communication", TMH 2006

(Using C)

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a two pass macro processor
6. Implement a single pass macro processor.
7. Implement an absolute loader.
8. Implement a relocating loader.
9. Implement pass one of a direct-linking loader.
10. Implement pass two of a direct-linking loader.
11. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
12. Implement a symbol table with suitable hashing

(For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place)

TOTAL= 45 PERIODS

Requirement for a batch of 30 students

S.No.	Description of Equipment	Quantity Required
1.	Hardware – Pentium PC Desktops	30 Nos.
2.	Software – TurboC (Freely download)	30 user License

1. Develop a Java package with simple Stack and Queue classes. Use JavaDoc comments for documentation.
2. Design a class for Complex numbers in Java. In addition to methods for basic operations on complex numbers, provide a method to return the number of active objects created.
3. Design a Date class similar to the one provided in the java.util package.
4. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism.
5. Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary exception handling in both the implementations.
6. Write a Java program to read a file that contains DNA sequences of arbitrary length one per line (note that each DNA sequence is just a String). Your program should sort the sequences in descending order with respect to the number of 'TATA' subsequences present. Finally write the sequences in sorted order into another file.
7. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons.
8. Develop a scientific calculator using event-driven programming paradigm of Java.
9. Develop a template for linked-list class along with its methods in Java.
10. Design a thread-safe implementation of Queue class. Write a multi-threaded producer-consumer application that uses this Queue class.
11. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.). Design a thread that generates prime numbers below 100,000 and writes them into a pipe. Design another thread that generates fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers common to both.
12. Develop a multi-threaded GUI application of your choice.

TOTAL= 45 PERIODS**Requirement for a batch of 30 students**

S. No.	Description of Equipment	Quantity Required
1.	Hardware: Pentium IV with 2 GB RAM, 160 GB HARD Disk, Monitor 1024 x 768 colour 60 Hz.	30 Nodes
2.	Software: Windows /Linux operating system JDK 1.6(or above)	30 user license

GE2321

**COMMUNICATION SKILLS LAB
(Fifth / Sixth Semester)**

**L T P C
0 0 4 2**

Globalisation has brought in numerous opportunities for the teeming millions, with more focus on the students' overall capability apart from academic competence. Many students, particularly those from non-English medium schools, find that they are not preferred due to their inadequacy of communication skills and soft skills, despite possessing sound knowledge in their subject area along with technical capability. Keeping in view their pre-employment needs and career requirements, this course on Communication Skills Laboratory will prepare students to adapt themselves with ease to the industry environment, thus rendering them as prospective assets to industries. The course will equip the students with the necessary communication skills that would go a long way in helping them in their profession.

OBJECTIVES:

- To equip students of engineering and technology with effective speaking and listening skills in English.
- To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.
- To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.

I. PC based session	(Weightage 40%)	24 periods
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A. ENGLISH LANGUAGE LAB (18 Periods)

1. LISTENING COMPREHENSION: (6)

Listening and typing – Listening and sequencing of sentences – Filling in the blanks - Listening and answering questions.

2. READING COMPREHENSION: (6)

Filling in the blanks - Close exercises – Vocabulary building - Reading and answering questions.

3. SPEAKING: (6)

Phonetics: Intonation – Ear training - Correct Pronunciation – Sound recognition exercises – Common Errors in English.

Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)

B. DISCUSSION OF AUDIO-VISUAL MATERIALS (6 PERIODS)

(Samples are available to learn and practice)

1. RESUME / REPORT PREPARATION / LETTER WRITING (1)

Structuring the resume / report - Letter writing / Email Communication - Samples.

2. **PRESENTATION SKILLS:** (1)
Elements of effective presentation – Structure of presentation - Presentation tools – Voice Modulation – Audience analysis - Body language – Video samples
3. **SOFT SKILLS:** (2)
Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity - Stress Management & Poise - Video Samples
4. **GROUP DISCUSSION:** (1)
Why is GD part of selection process ? - Structure of GD – Moderator – led and other GDs - Strategies in GD – Team work - Body Language - Mock GD -Video samples
5. **INTERVIEW SKILLS:** (1)
Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews- Video samples.

II. Practice Session	(Weightage – 60%)	24 periods
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1. **Resume / Report Preparation / Letter writing:** Students prepare their own resume and report. (2)
2. **Presentation Skills:** Students make presentations on given topics. (8)
3. **Group Discussion:** Students participate in group discussions. (6)
4. **Interview Skills:** Students participate in Mock Interviews (8)

REFERENCES:

1. Anderson, P.V, **Technical Communication**, Thomson Wadsworth, Sixth Edition, New Delhi, 2007.
2. Prakash, P, **Verbal and Non-Verbal Reasoning**, Macmillan India Ltd., Second Edition, New Delhi, 2004.
3. John Seely, **The Oxford Guide to Writing and Speaking**, Oxford University Press, New Delhi, 2004.
4. Evans, D, **Decisionmaker**, Cambridge University Press, 1997.
5. Thorpe, E, and Thorpe, S, **Objective English**, Pearson Education, Second Edition, New Delhi, 2007.
6. Turton, N.D and Heaton, J.B, **Dictionary of Common Errors**, Addison Wesley Longman Ltd., Indian reprint 1998.

LAB REQUIREMENTS:

1. Teacher console and systems for students.
2. English Language Lab Software
3. Career Lab Software

Requirement for a batch of 60 students

Sl.No.	Description of Equipment	Quantity required	Quantity available	Deficiency %
1.	Server	1 No.		
	o PIV system			
	o 1 GB RAM / 40 GB HDD			
	o OS: Win 2000 server			
	o Audio card with headphones (with mike)			
o JRE 1.3				
2.	Client Systems	60 No.		
	o PIII or above			
	o 256 or 512 MB RAM /40 GB HDD			
	o OS: Win 2000			
	o Audio card with headphones (with mike)			
o JRE 1.3				
3.	Softwares			
	a) Interactive Teacher Control Software	Available / Not Available		
	b) English Language Lab Software	Available / Not Available		
	c) Career Lab software	Available / Not Available		
4.	Handicam Video Camera (with video lights and mic input)	1 No.		
5.	Television - 29"	1 No.		
6.	Collar mike	1 No.		
7.	Cordless mikes	1 No.		
8.	Audio Mixer	1 No.		
9.	DVD Recorder / Player	1 No.		
10.	LCD Projector with MP3 /CD /DVD provision for audio / video facility - Desirable	1 No.	Available / Not Available	

L: 45, T: 15, TOTAL= 60 PERIODS