M. Sc.
INFORMATION TECHNOLOGY

SYLLABUS (2007-2010)

under
CHOICE BASED CREDIT SYSTEM
(CBCS)

ST. JOSEPH'S COLLEGE (AUTONOMOUS)
(Nationally Reaccredited with A+ Grade/
College with Potential for Excellence)

TIRUCHIRAPPALLI - 620 002

FEATURES OF CHOICE BASED CREDIT SYSTEM (PG COURSES)

The Autonomous St. Joseph's College (1978) Reaccredited with A+ Grade from NAAC (2007) has introduced the choice based credit system (CBCS) for UG and PG courses from the academic year 2001-2002.

OBJECTIVES of Credit System:
* To provide mobility and flexibility for students within and outside the parent department
* To provide broad based education
* To help students learn at their own pace
* To provide students scope for acquiring extra credits
* To impart more job oriented skills to students
* To make any course multi-disciplinary in approach

What is credit system?
Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. However, there could be some flexibility because of practicals, field visits and tutorials. The following Table shows the relation between credits and hours.

Hours in a week	Hours (2-3)	Hours (4)	Hours (5-6)
Theory Credits	1	3	4
Practicals Credits	1	2	3

For PG courses (2 years) a student must earn a minimum of 100 credits. For MCA course (3 years) the student must earn 140 credits to get a pass. For a two year PG degree course the minimum number of papers offered by a department is 18.

COURSE PATTERN
The Postgraduate degree course consists of three major components. They are Core Course, Optional Course and Extra Department Course (EDC).

Core Course
A core course is the course offered by the parent department, totally related to the major subject, components like Practicals, Projects, Group Discussion, Viva, Field Visit, Library record form part of the core course. All the students of the course must take the core courses.

Optional Course
The optional course is also offered by the parent department. The objective is to provide choice and flexibility within the department. The student can choose his/her optional. The optional is related to the major subject. The difference between core course and optional course is that there is choice for the student. The department is at liberty to offer optional course every semester or in any two semesters. It must be offered at least in two semesters. The staff too may experiment with diverse courses.

Extra Department Course (EDC)
EDC is an interdepartmental course offered by a department for the students belonging to other departments. The objective is to provide mobility and flexibility outside the parent department. This is introduced to make every course multi-disciplinary in nature. It is to be chosen from a list of courses offered by various departments. The list is given at the end of the syllabus copies. Two EDCs must be taken by students.

**Day College student may also take an EDC from PG SFS Course and *vice versa.* ** This provision enables students to earn extra credits. The EDCs are offered in the II and III semesters. For the day college student it is offered in the last hour and for the PG SFS course students in the first hour or zero hour. The EDCs are expected to be application oriented and inter-disciplinary.

For Two Year Degree Programme			**For Three Year MCA Programme**		
	Credits			Credits	
Core	-	84	Core	-	121
Optionals	-	8 (2 semesters)	Optionals	-	8 (2 semesters)
EDC	-	6	EDC	-	9
Shepherd	-	2	Shepherd	-	2
Total	-	100	Total	-	140

Credit System Codes:

The various papers in the different courses are coded. The following code system is adopted.

Each code indicates the following particulars

1) The year of introduction/revision of syllabus (07)
2) Whether it is undergraduate or postgraduate course (U or P)
3) The discipline's name is indicated by two letters as shown below:

Sl. No.	Course	Subject Code
1.	Biochemistry	BI
2.	Biotechnology	BT
3.	Business Administration	BU
4.	Chemistry	CH
5.	Commerce	CO
6.	Computer Applications	CA
7.	Computer Science	CS
8.	Economics	EC
9.	English	EN
10.	English - General	GE
11.	Electronics	EL
12.	Foundation Course	FC
13.	French	FR
14.	Hindi	HI
15.	History	HS
16.	Human Resource Management	HR
17.	Information Technology	IT
18.	Mathematics	MA
19.	Physics	PH
20.	Plant Biology & Plant Biotechnology	PB
21.	Personnel Management & Industrial Relations	PM
22.	Sanskrit	SA
23.	Statistics	ST
24.	Tamil	TA
25.	Tamil - General	GT
26.	Transport Management	TM
27.	Journalism (EDC)	JO
28.	Law (EDC)	LA
29.	Short Hand (English) (EDC)	SH

4) The semester number (1 or 2 or 3 or 4 for 2-year course)
5) The paper number: The courses in the discipline fall into three categories
   Core papers-numbers   : 20 to 39
   Optional papers - numbers : 41 to 49
   EDC's   : 61 to 70
   For MCA course offered by Department of Computer Science, the following paper numbers used:
   Core papers   : 51 to 80
   Optional Papers   : 81 to 90

The following examples illustrate the above concept.
The first semester Core papers in Chemistry is given the code 07PCH121
The EDC offered by Chemistry department in Semester III is given the code 07PCH362

Evaluation:
For each course there is formative continuous internal assessment (CIA) and semester examinations (SE) in the weightage ratio 50:50. The following table illustrates how one evaluates the Overall Percentage Marks (OPM) for a student in Chemistry PG course in the all papers put together
OPM= $(a_1b_1+a_2b_2+ .. a_{23}b_{23}) / (b_1+b_2+ …+ b_{23})$
Where $a_1 ,a_2 ... a_{23}$ indicate the marks obtained in the 4 semesters for 23 papers and $b_1 ,b_2 … b_{23}$ indicate the corresponding credits for the 23 courses.
For example if total credit points in 23 papers is 6860 then the OPM is given by
OPM = 6860/total number of credits = 6860.0/98=70.0

If OPM is between 50 and 60, the student gets II class. If OPM is 60 and more, then the student is placed in I class. If the OPM score is 75 and more the student gets first class with distinction.
The performance in shepherd programme is indicated by a pass and is not taken into account for computing OPM.

Declaration of result

———————— has successfully completed M. Sc. degree course with FIRST CLASS. The student's overall average percentage of marks is 70. The student has acquired 2 more credits in SHEPHERD programme.

M. Sc. INFORMATION TECHNOLOGY - COURSE PATTERN

Sem	Code	Subject Title	Hrs/ Week	Crdit
I	07PIT121	Database Systems	5	5
	07PIT122	Data Structures & Algorithms	5	5
	07PIT123	Bioinformatics Tools	5	5
	07PIT124	Linux with C	5	5
	07PIT125	Software Lab – I (LINUX & C)	3	2
	07PIT126	Software Lab – II (RDBMS)	3	2
	07PIT127	Personal Soft Skills **	3	2
		Library	1	
Total for Semester I			**30**	**26**
II	07PIT228	Java Programming	5	5
	07PIT229	Computer Communication Networks	5	5
	07PIT230	Software Engineering	5	5
	07PIT231	Software Lab – III (JAVA)	3	2
	07PIT232	Interpersonal Soft Skills **	3	2
	07PIT241	Distributed Operating System OR		
	07PIT242	Principles of Information Technology	5	4
	*	EDC	4	3
Total for Semester II			**30**	**26**
III	07PIT333	Web Technology	5	5
	07PIT334	XML and WAP	5	5
	07PIT335	Management Information System	5	5
	07PIT336	Software Lab – V (ASP & XML)	3	2
	07PIT337	Mini Project	3	2
	07PIT343	Data Warehousing & Data Mining OR		
	07PIT344	TCP / IP	5	4
	*	EDC	4	3
Total for Semester III			**30**	**26**
IV	07PIT438	Major Project	30	22
Total for Semester IV			**30**	**22**
IV		Extension Service: SHEPHERD		2
Total Credits for All Semesters				**100**

*   Code numbers according to the subjects chosen.
** Soft Skills will have only viva-voce exam conducted by a panel.

Sem:I   Hours/week:5
07PIT121   Credit:5

DATABASE SYSTEMS

AIM
To give a detailed knowledge about different approaches to the database system giving emphasis to relational approach and concurrency management.

UNIT 1   12 Hrs
DATABASE SYSTEM: Purpose - view of data - data models - database languages - transaction management - storage management - database administrator - database users – database structure - entity-relationship model: Mapping constraints - keys - E-R diagram   - extended E-R-features - relational model: Structure - relational algebra – Relational algebra operators.

UNIT 2   13 Hrs
SQL: Introduction to Data Definition Language, Data Manipulation Language, Transaction Control Language, Data Control Language - Views - embedded SQL - Query By Example - Integrity constraints: Domain constraints - referential integrity - assertions - triggers.

UNIT 3   12 Hrs
NORMALIZATION: 1NF - functional dependency - 2NF - transitive dependency - 3NF - BCNF - multivalued dependency and Fourth Normal form – join dependency and fifth normal form.

UNIT 4   13 Hrs
TRANSACTION: Concept - transaction state - concurrent execution - serializability - recoverability - Concurrency control: Lock based protocols - time-stamp based protocols - validation based   protocols - multiple granularity - multiversion schemes.

UNIT 5   13 Hrs
DISTRIBUTED DATABASES: Data   storage - distributed query processing - distributed transaction model. PARALLEL DATABASES: Introduction - I/O Parallelism - Interquery - Intraquery   parallelism - Intra operation and Inter operation parallelism - Design of parallel system.

Books for Study
1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan "Database Systems Concepts", 4th Ed., McGraw Hill International, Singapore, 2002.
   Units I, II, IV and V
   Ch:1,2,3.1,3.2,3.3,4.7,4.12,5.1,6.1,6.3,6.4,15,16,19.2,19.3,19.7,20.1,20.2,20.4,20.5, 20.6
2. Date, C.J. "An Introduction to Data Systems", Addision - Wesley, New York, 2000.
   Unit III
   Ch: 11.1,11.2,11.3,11.4,11.5,12.2,12.3

Books for Reference
1. Bipin C.Desai, "An Introduction to Database Systems", Golgotia, New Delhi, 2005.
2. Jeffrey D.Ullman, "An Introduction to Database Systems", Galgotia, New Delhi, 2005.

Sem:I   Hours/week:5
07PIT122   Credit:5

DATA STRUTURES AND ALGORITHMS

AIM

To give a detailed knowledge on Data structures and to give an exposure in the development of algorithms related to data structures.

UNIT 1   12 Hrs

PRIMITIVE DATA STRUCTURE: Introduction - operations of data structure – number systems - integer, real numbers, characters, logical and pointer information and their representation. Linear data structures: Concepts on non-primitive data structures – storage structure for arrays – stack – operations on stacks - application of stacks - queues and its applications - priority queues.

UNIT 2   13 Hrs

LINEAR & NON-LINEAR DATA STRUCTURES: Linked linear list - operations on linked linear list - circularly linked linear list – doubly linked linear list - application of linked linear list. Non-linear data structure: Tress - binary trees - operations on binary trees - storage representation and manipulation of binary trees – conversation of general trees into binary trees.

UNIT 3   12 Hrs

DYNAMIC STORAGE MANAGEMENT: Fixed block and first-fit storage allocation - Best fit storage allocation - storage release - buddy system - garbage collection - compaction.

UNIT 4   13 Hrs

SORTING: Array sorting - sorting by straight insertion, selection, exchange - sort by diminishing increments - tree sort - partition exchange sort - sorting sequential files -straight merging - natural merging - polyphase sort.

UNIT 5   13 Hrs

SEARCHING METHODS & RECURSIVE ALGORITHMS: Searching methods - searching - sequential and binary searching - search trees - hash table method. Recursive algorithms - Hilbert's curve, Sierpinski curve, backtracking algorithms – the eight queens problem, Knight's tour problem.

Books for Study

1. Jean-Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with Applications", 2nd Ed., Tata McGraw Hill, New Delhi, 2005.
      UNITS I, II, III, V(a)
     Ch: 1.1 - 1.4 3.1 – 3.4, 3.5.2, 3.6,3.8,4.1 – 4.3.1, 5.1 & 5.6, 6.2
2. Niklaus Wirth, Algorithms + Data Structures = Programs", Prentice Hall of India, New Delhi, 2002.
      UNITS IV, V(b)
      Ch: 2.1, 2.2, 2.3.1, 2.3.2 & 2.3.4, 3.1 – 3.5

Books for Reference

1. Ellis Horowitz, Sartaj Sahni & Senguthevar Rajasekaran "Fundamentals of Computer Algorithms", Galgotia Publications, New Delhi, 2005.
2. P.S.Deshpande & O.G. Kalede, "C & Data Structures", Dreamtech Press, New Delhi, 2003.
3. Robert L. Krune, Clovis L. Tondo & Bruce P. Leung, "Data structures & Program Design in C", Prentice-Hall, New Delhi, 2002

Sem:I   Hours/week:5
07PIT123   Credit:5

BIOINFORMATICS TOOLS

AIM
To introduce the basic concepts of Bioinformatics and Software Tools to retrieve and analyze gene sequences and Bioinformatic language BioJava.

UNIT 1   12 Hrs
INTRODUCTION: Definition - Applications - Major databases - Central dogma of bioinformatics – Tools for web search - Data retrieval tools - Data mining of biological databases.

UNIT 2   12 Hrs
GENE ANALYSIS: Genome Analysis - Identification of genes in contigs – Biological motivation of alignment problems - Methods of sequence alignments - Using Scoring matrices - Measuring sequence detection efficiency.

UNIT 3   12 Hrs
PHYLOGENETIC ANALYSIS: Methods of multiple sequence alignment - Phylogenetic analysis - Methods of phylogenetic analysis - Automated tools of phylogenetic analysis – FASTA - BLAST - Comparison of FASTA and BLAST - other programs.

UNIT 4   12 hrs
GENE IDENTIFICATION: Basis of gene prediction - Pattern recognition - Gene prediction methods - Gene prediction tools – DNA Microarrays - Clustering gene expression profiles - Data sources and tools for Microarray analysis.

UNIT 5   12 hrs
PROTIOMICS: Overview - Protein Structure - Visualization - Classification - Databases - Tools - Primary, Secondary Structure analysis - Motives, Profiles, Patterns, Finger Print Search - Sequence based, *Ab initio* prediction

Books for Study
1. Rastogi, S.C., Mendiratta, N., Rastogi, P., "Bioinformatics Methods and Applications: Genomics, Proteomics and Drug Discovery", PHI, New Delhi, 2004.
    Unit I: 1.2-1.4, 1.7, 2.2-2.4
    Unit II: 3.2, 3.11, 4.1-4.5
    Unit III: 5.2, 5.5, 5.9, 6.2, 6.3, 6.5, 6.6
    Unit IV: 8.1-8.5, 9.1-9.5
    Unit V: 10, 11

Books for Reference
1. Attwood, T.K., "Introduction to Bioinformatics", Pearson Pub, New Delhi, 2002.

Sem:I   Hours/week:5
07PIT124   Credit:5

LINUX WITH C

AIM
To develop programming skills using C language and to understand the principles of Linux operating system for effective system administration.

UNIT 1   12 Hrs
C FUNDAMENTALS: The C character set - identifiers and keywords - data type – constants - variables and arrays – declarations – expressions – statements - operators and expressions: Arithmetic operators - unary operators - relational and logical operators - assignment operators - the conditional operator - library functions - control statements.

UNIT 2   13 Hrs
ARRAY: Defining an array - processing an array - passing arrays to functions- multidimensional array - arrays and strings. FUNCTIONS: Defining a function accessing a function - function prototype - passing arguments to a function - recursion. STRUCTURE AND UNIONS: Defining a structure - processing a structure - structures and pointers - passing structures to functions - unions.

UNIT 3   13 Hrs
POINTERS : Pointer declaration - passing pointer to function - dynamic memory allocation - operations on pointers - passing functions to other functions - file handling.

UNIT 4   12 Hrs
LINUX ADMINISTRATION: Administration: understanding system administration - root login - super user - GUI tools, commands and log files - configuring hardware - file system and disk management - monitoring performances. Setting up and supporting users: Creating user accounts - setting user defaults creating desktops - modifying and deleting accounts.

UNIT 5   13 Hrs
SECURITY: Computer security issues - Linux security checklist - using password protection - securing Linux with IP cables firewalls - controlling access to services with TCP wrapper checking log files - using the secure shell package - securing Linux servers.

BOOKS FOR STUDY
1. Byron S. Gottfried, ”Programming with C”, 2nd Ed., Tata McGraw Hill, New Delhi, 1998. UNITS I, II & III
2. Christopher Negus, "Red Hat Linux 9 Bible", 1st Ed., WILEY- Dreamtech India, New Delhi, 2003.
    UNITS IV & V
    Ch: 2,3 6,9,7 10,11,8.10,11,14,15

BOOKS FOR REFERENCE
1. Brian W. Kernighan, Dennis M. Ritchie,” The C Programming Language”, Prentice Hall, New Delhi, 1989.
2. Thomas Schenk, ”Red Hat Linux System Administration”, Techmedia, New Delhi, 2003.

Sem:I   Hours/week:3
07PIT125   Credit:2

SOFTWARE LAB – I (LINUX & C)

PROGRAMMING IN C:

1. Program to count the number of words, lines and characters in a text file.
2. Program for payroll processing using sequential files.
3. Program to push and pop the elements in stacks.
4. Program to add and delete the items in queue.
5. Program to insert, delete, traverse the elements in linked list.
6. Program to insert and delete the elements in heap sort.

LINUX:

1. Pipes.
2. Messages.
3. Semaphore.
4. Message passing.

Sem:I   Hours/week:3
07PIT126   Credit:2

SOFTWARE LAB – II (RDBMS)

1.   Table creation and simple queries.

2.   Queries using aggregate function

3.   Queries using set operators

4.   Table creation with various joins

5.   Nested sub queries and correlated sub queries

6.   View creation and manipulation

7.   PL/SQL program to prepare Mark Sheet

8.   PL/SQL program to prepare Electricity Bill

9.   PL/SQL program using Procedure and Function

10. PL/SQL program using Trigger and Packages.

Sem:I   Hours/Week:4
07PIT127   Credits:3

PERSONAL SOFT SKILLS

Aim:
To impart basic personal soft skills like listening, speaking, reading, writing, learning in order to empower the students for better educational performance.

Unit 1   12 Hrs
LISTENING SKILL: What is Listening – Importance of Listening – Active and Passive listening – Reasons to Improve listening – Roadblocks to Effective Listening – Types of Effective Listening – Questions to Ask Yourself in conversations – Improving Listening Skills – Listen to the Feelings – Exercises for Listening to Feeling, Role-Play Activities.

Unit 2   12 Hrs
SPEAKING SKILL: What is Speaking – Opening a Speech – Speaking to the Hearts – Attention Gaining Devices – Storytelling Techniques - Humor Techniques – Speech Gimmicks – Performance Techniques – Closing a Speech – Speech Exercises.

Unit 3   12 Hrs
READING SKILL: What is Reading – Problems with Reading – Deciding What to Read – Getting Ready to Read – Different Types of Reading – Active Reading – SQ4R – Taking Notes from Reading – Improve your Reading – Exercises for Reading.

Unit 4   12 Hrs
WRITING SKILL: What is Good Writing – Establish your Topic – Organize your Ideas – Target Audience – Presentation Techniques – Language Usage – Resume Writing – E-main Writing – Telephone Etiquette – Exercises for Writing.

Unit 5   12 Hrs
LEARNING SKILL: Introduction to Learning – Learning Styles – Taking Notes – Learning for exams – time Management – Stress Management – Exercises for Learning Techniques.

Book for Reference

1. E.H.McGrath S.J., "Basic Managerial Skills for All ", 6th Ed., Prentice Hall, New Delhi, 2004.

Sem:II   Hours/week:5
07PIT228   Credit:5
JAVA PROGRAMMING
AIM
✧ To provide a sound understanding of fundamental concepts of Object Technology.
✧ To facilitate mastery of the notation and process of Object-Oriented modeling and design.
✧ To teach realistic application of Object-Oriented software systems.

Unit 1   13 Hrs
OVERVIEW: Object-Oriented System Development – Object basics – Development Life Cycle – Object Oriented Methodologies – Unified Modeling Language. Object Oriented Analysis: Use-Case Driven – Process – Identifying use cases.

Unit 2   13 Hrs
OBJECT ANALYSIS: Classification – Identifying Object relationships, attributes, and methods. Object Oriented Design: The Object-Oriented design process and design axioms – Designing classes.

Unit 3   13 Hrs
JAVA: Classes - Inheritance: Super class - Sub class - 'Super' Keyword – Method overriding – abstract class. Packages and Interfaces: Packages – importing packages – Interfaces. Exception Handling: Exception types – Multiple catch clauses – nested try statement.

Unit 4   13 Hrs
THREADS: Model – priorities – synchronization – interthread communications. Applets: Architecture – display methods. String Handling: String constructors – string operations – string buffer. AWT: Classes – controls – layout managers – menus – event model. STREAM I/O AND FILES: I/O classes and interfaces – files – stream classes – byte streams – character streams – serializations. SERVLETS: Life cycle of a servlet – handling HTTP requests and responses. Networking: Networking classes and interfaces – InetAddress – Datagrams.

Unit 5   13 Hrs
BIOJAVA: Introduction to Biojava - Symbols and Symbol Lists - Sequences - Features and Feature Holders - Creating New Features - String to Sequence and Sequence to String - Getting DNA, RNA, Protein Alphabets - Rearing Sequences from GenBank, SwissProt, EMBL File - Displaying a Sequence in GUI - Editing a Sequence - Getting Subsections of a Sequence - Calculating Frequencies of Residues in a Sequence - Transcribing DNA sequence to RNA Sequence - Reverse Complementing a DNA, RNA Sequence.

Books for Study
1. Ali Bahrami, "Object Oriented Systems Development using the UML", McGraw-Hill, California, 1999. Ch: 1 to 13
   Units I & II
2. Herbert Schildt, "The Complete Reference Java 2", 5th Ed., Tata McGraw-Hill. New Delhi, 2002. Ch: 2 to 13, 17- 22, 25,27
   Units III, IV & V
3. Biojava Manual - Unit V

Book for Reference
1. Andrew Haigh, "Object Oriented Analysis and Design", Tata McGraw-Hill, New Delhi, 2001.
2. Grady Booch, "Object-Oriented Analysis and Design", 2nd Ed., Addison -Wesley, California, 1994.
3. Patrick Naughton, Herbert Schildt, "The Complete Reference-Java", Tata McGraw Hill, New Delhi, 1997.

Sem:II   Hours/week:5
07PIT229   Credit:5
COMPUTER COMMUNICATION NETWORKS

AIM
To offer the basic concepts of Computer Network & TCP/IP

UNIT 1   12 Hrs
INTRODUCTION: Uses of computer networks--Network Hardware--Network Software--Reference Models--PHYSICAL LAYER: Transmission media-Wireless transmission--Communication Satellite - Public Switched telephone Network-Mobile telephone system-Cable Television.

UNIT 2   12 Hrs
DATALINK LAYER: Design Issues-Error detection & Correction-Elementary data link protocols-Sliding Window Protocol – The Channel Allocation Problem-Multiple Access Protocols-Wireless LANs-Broadband Wireless –Blue tooth - NETWORK LAYER: Design Issues-Routing Algorithm-Congestion Control Algorithm-Quality of Service-Inter Networking-Network layer in the Internet

UNIT 3   12 Hrs
TRANSPORT LAYER: The Transport Service-Elements of transport protocol-Internet Transport protocol-APPLICATION LAYER: Domain Name System-Email-World Wide Web - Multimedia

UNIT 4   12 Hrs
TCP/IP: Overview of TCP/IP-Internetworking-IP data gram-User Datagram Protocol (UDP Hrs - Reliable stream transport service (TCP Hrs-TCP/IP over ATM networks-Mobile IP

UNIT 5   12 Hrs
PRIVATE NETWORK INTERCONNECTION (NAT, VPN Hrs-Socket Interface-Bootstrap & auto configuration-Domain Name System (DNS Hrs-APPLICATIONS: Remote login-File transfer & access-Email-WWW-Voice &Video over IP-SNMP-Internet security & firewall design

Books for Study
1. Andrew S.Tanenbaum, ”COMPUTER NETWORKS”, PHI, New Delhi,2006.
   Units I, II & III
2. Douglas, "INTERNETWORKING AND TCP/IP", PHI, Fifth Edition, New Delhi, 2005
   Units IV & V

Book for Reference
1. Behrouz A.Forouzan with Sophia Chung Fegan, "TCP/IP Protocol Suite", Third Edition, Tata McGraw-Hill, New Delhi, 2006.
2. Vijay Ahuja, "Design and Analysis of Computer Communication Networks", McGraw Hill, New York, 1985.

Sem:II   Hours/week:5
07PIT230   Credit:5

SOFTWARE ENGINEERING

AIM
To provide the basic concepts of software engineering and various phases in software development and testing.

UNIT 1   13 Hrs
INTRODUCTION TO SOFTWARE ENGINEERING: The evolving role of software – software - the changing nature of software. The software process: A generic view of process: software engineering - a layered technology - a process framework - the capability maturity model interaction - process patterns - process assessment - personal and team process. Process models - the specification model.

UNIT 2   12 Hrs
SYSTEM ENGINEERING: Computer - based system - the system engineering hierarchy - business process engineering - product engineering - system modeling. Requirement Engineering: A bridge to design and construction - requirements engineering tasks - initiating the requirements engineering - eliciting requirements - building the analysis model - validating requirements - requirements analysis - analysis modeling approaches - data modeling concepts - object-oriented analysis - flow-oriented modeling - creating a behavior.

UNIT 3   12 Hrs
DESIGN ENGINEERING: Design within the context of software engineering - design process and design quality - design concepts - the design model - pattern bases design model - creating an architectural styles and patterns - mapping data flow into software architecture modeling.

UNIT 4   12 Hrs
COMPONENT LEVEL AND INTERFACE DESIGN: Definition of component - designing class - based components - conducting component - level design - object constraint. Interface Design - golden rules - user interface analysis and design. Interface Analysis – interface design steps - design evaluation.

UNIT 5   13 Hrs
TESTING AND QUALITY MANAGEMENT: Testing Tactics - Software testing fundamentals - black box & white box testing - basis path testing - control structure testing - black box testing - object-oriented testing models. Testing strategies: A strategic approach to software testing - strategic issues - validation testing system - system testing - the art of debugging. Quality management: Quality concepts - software quality assurance - software quality reviews - formal technical reviews - software reliability.

Books for Study
1. Roger S. Pressman, "Software Engineering A Practioner's Approach", 6th Ed., McGraw Hill, New York, 2005.
   Ch: 1-14,26.
Book for Reference
1. Ian Sommerville, " Software Engineering", 5th Ed., Addition Wesley, Singapore,2002
2. Stephen R. Schach , " Classical and object oriented Software engineering", 4th Ed., McGraw Hill, New Delhi, 1999.

Sem:II   Hours/week:3
07PIT231   Credit:2

SOFTWARE LAB – III (JAVA)

1. Arrays and Vector
2. Inheritance and Method overriding
3. Interfaces & Packages
4. Multithread programming
5. Streams
6. Applets and AWT
7. JDBC
8. Networking
9. Conversion a string to sequence and vice versa and displaying the sequence in GUI
10. Counting the number of residues in a sequence
11. Transcribing and Reverse complementing DNA sequence to RNA sequence

Sem:II   Hours/Week:3
07PIT232   Credit:2

INTERPERSONAL SOFT SKILLS

AIM
To impart various interpersonal skills which are needed for job hunting and working in the industry.

Unit 1   12 Hrs
COMMUNICATION SKILL: Importance of Right Communication – Body Language – Facial Expressions – Eye Contact & Eye Movements – Tone of Voice – Languages - Etiquettes – Cross Cultural Communication – Exercises for Communication.

Unit 2   12 Hrs
GROUP DISCUSSION & INTERVIEW TECHNIQUES: Components of Group Discussion – Points to Remember in Group Discussion – Personal Interview Techniques – Mock Interview – Stress Interview – Exercises for group Discussion – Exercises for Interview.

Unit 3   12 Hrs
LEADERSHIP SKILL: Definition of Good Leader – Different Kinds of Leaders – Personal Qualities of a Good Leader – Relationship Traits of a Good Leader – Leadership Strategies – Role of a Leader – Leading and Motivation – Managerial Skills for a Good Leader – Exercises for Leadership.

Unit 4   12 Hrs
TEAM BUILDING: Importance of Team Work – Intra and Inter Team Work – Team Building – Conflict Management – Negotiation – Persuasion – Assertive Skills – Dealing with Difficult Behaviors – Exercises for Team Building.

Unit 5   12 Hrs
PROFESSIONAL EFFECTIVENESS: Importance of Professional Effectiveness – Self management – Creativity Management – Time Management – Stress Management – Priority Management – Presentation Management – Change Management – Exercises for Professional Effectiveness.

Book for Reference:
Mohan, "Basic Managerial Skills for All", 6th Ed., Prentice Hall Of India, New Delhi.

Sem:II   Hours/week:5
07PIT241   Credit:4
Optional: DISTRIBUTED OPERATING SYSTEM

Aim
To provide a clear description of the fundamental concepts in an operating system and design principles that are applicable to a variety of distributed operating system.

Unit 1   12 Hrs
INTRODUCTION: Meaning –Early Systems – Multiprogrammed batch systems - Real-Time Systems. Computer-system Structures: Computer-system operation – Storage Hierarchy – General System Architecture – Operating system structures: System components – System calls - Virtual machines – System generation.

Unit 2   13 Hrs
PROCESS MANAGEMENT: Processes – process concept – operation on processes – inter-process communication. CPU scheduling: Basic concepts – scheduling algorithms – real time scheduling. Process Synchronization – background – critical - selection problem – semaphores - Deadlocks – System model – methods for handling deadlocks – deadlock avoidance – recovery from deadlock.

Unit 3   13 Hrs
DISRIBUTED COMPUTING SYSTEM: Evolution - models - distributed operating system - issues in designing DOS - distributed computing environment. Communication In Distributed System: Protocols - features of good message passing system - issues in IPC by message passing - synchronization-buffering - process addressing - failure handling - group communication.

Unit 4   12 Hrs
SYNCHRONIZATION: Clock synchronization – event ordering - mutual exclusion-deadlock - election algorithms. Process Management: Process migration - threads.

Unit 5   13 Hrs
SECURITY: Potential attacks to computer systems – cryptography – authentication - access control - digital signatures - design principles. Inter Process Communication: Process tracing - System V IPC - sockets. Multi Processor Systems: Problem of multiprocessor systems - solution with master and slave processors - solution with semaphores.

Books for Study
1. Abraham Silberschatz and Peter Baer Galvin, "Operating System Concepts", 4th Ed., Addison Wesley., New York, 1999.
Unit I & II
2. Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design", Prentice Hall, New Delhi,2004.
Unit III, IV &V

Book for Reference
1. Andrew S Tanaenbaum, "Modern Operating Systems", Prentice Hall, New Delhi, 1997.
2. W.Richard Stevens, " UNIX Networking Programming", Prentice Hall, New Delhi, 1993.

Sem:II   Hours/week:5
07PIT242   Credit:4

Optional: PRINCIPLES OF INFORMATION TECHNOLOGY

AIM
To give a overall view of the information technology comprising of operating systems, application software, internet, intranet, multimedia, telephone networks, etc.

UNIT 1   12 Hrs
THE DIGITAL AGE: An Overview of the Evolution in Computer Communications: Overview of a Computer & Communications System & elements - People & Procedure -Data / Information - Hardware Software Communications. Overview of developments in communications Technology - Connectivity and Interactivity.

UNIT 2   12 Hrs
APPLICATION SOFTWARE: Common features of Software - Data base Software - Financial Software - Software for Cyberspace: Communications, E-Mail, Web Browsers. System Software: Three Components of system software - The operating System - Common Microcomputer Operating Systems: OS/2, UNIX, Windows NT - Utility Programs.

UNIT 3   13 Hrs
INTERNET AND INTRANET: Introduction – What is internet – Internet Access – Internet protocols – Internet Addressing – www – searching the web. Introduction to Intranet – Characteristics of intranet – Advantages and Disadvantages of intranet – Intranet Vs Client-Server System - Relationship between intranet, extranet and e-commerce

UNIT 4   13 Hrs
MULTIMEDIA TOOLS: Introduction – Uses of multimedia. Multimedia Tools: Paint and Draw applications – Graphic effects and Techniques – Sound and music – Video – Multimedia Authority tools – Virtual Reality

UNIT 5   13 Hrs
TELECOMMUNICATIONS: The Practical uses of Communications & Connectivity - Telephone Related Communications Services - Video I Voice Communication - On line Information Services - The Internet - The World Wide Web - Shared Resources: Work Group computing, EDI & Intranets & Extranets – More Internet Technologies, Phone, Radio & T. V. Communication Technology: Tele Computing & Virtual Offices - Using Computers to Communicate: Analog & Digital Signals, Modems & Other Technological Basics - Communications Channels - The Conduits of communications - communication Networks local Networks.

Books for Study
1. Stacey Sawyer, Brian K. Williams, Sarah E. Hutchinson, "Using Information Technology – A Practical Introduction to Computers and Communications", 3rd Ed., McGraw Hill, New York, 1999.
2. Alexis Leon, Mathews Leon, "Fundamentals of Information Technology", Leon Tech World

Sem:III   Hours/week:5
07PIT333   Credit:5
WEB TECHNOLOGY

AIM
To highlight various features about web technology and developing web based applications.

UNIT 1   12 Hrs
INTRODUCTION: Internet Principles – Basic web concepts – Client / Server Model – Retrieving data from Internet – HTML – Scripting Languages

UNIT 2   12 Hrs
COMMON GATEWAY INTERFACE PROGRAMMING: HTML forms – CGI Concepts – Server Browser Communication – Email Generation – CGI client side scripts – CGI server side scripts – Authentication and security

UNIT 3   13 Hrs
WEB SERVICES: Introduction to Web Services – Web Service Description Language – Using WSDL on Server and Client – Directory Services – Universal Description, Discovery and Integration (UDDI) – Publishing to a UDDI Registry – Querying UDDI

UNIT 4   13 Hrs
SERVER SIDE PROGRAMMING: Dynamic web content – Cascading style sheets [CSS] – Dynamic HTML – XML – Active Server Pages [ASP] - Firewalls.

UNIT 5   12 Hrs
ONLINE APPLICATIONS: Simple applications – Online databases – Monitoring User Events – Plug – ins – Database connectivity – Internet Information Services [IIS} – Internet Commerce

Books for Study
1. R.Bremnath, C.S.Senthil Raja, V.Sivakumar, "Web Technology version 1.0", Pratheeba Publications, Coimbatore, 2004.
   Ch: 1.1-1.6, 2.2, 2.3, 2.5-2.9, 4.1-4.4, 4.7, 4.9, 5.1-5.7
   UNITS I,II,IV & V
2. Mike Jasnowski, "JAVA, XML & Web Services", IDG Books, New Delhi, 2002. Ch: 28,29
   UNIT III

Book for Reference
1. Niit, "ASP Programming", Raduga, New Delhi, 2004
2. Deitel, "XML How to Program Java2, Perl, CGI, Active Server Pages", Pearson Education, New Delhi, 2000.

Sem:III   Hours/week:5
07PIT334   Credit:5

XML & WAP

AIM

To understand the basics of an XML documents, style sheets and document type definitions and study the features of WAP.

UNIT 1   12 Hrs

INTRODUCTION TO XML: An Eagle Eye view of XML - XML definition – Life of an XML document - Related technologies - An introduction to XML applications - XML applications - XML for XML – First XML document. Structuring the data: Examining the data - XMLizing the data – the advantage of the XML format - preparing a style sheet for document display.

UNIT 2   13 Hrs

ATTRIBUTES, EMPTY TAGS AND XSL: Attributes - Attributes Vs elements - empty tags. XSL well formedness: Well formed rules - XML documents - text in XML - processing instructions – Unicode - Foreign Languages and Non Roman Text: Non Roman Script on the web-Scripts, Character set, Fonts - Legacy character sets - Unicode Character sets - How to write XML in unicode.

UNIT 3   13 Hrs

DOCUMENT & TYPE DEFINITION: Document type definition and validity - Document Type declaration - Validation against DTD - Listing elements - Element declaration - Comments in DTD - Entities and external DTD subset - Attribute declaration in DTD's - Attribute type - Predefine Attribute - EMBEDDING NON XML DATA: Notation -Unparsed external entities - Processing instruction - Condition section in DTD's

UNIT 4   12 Hrs

OVERVIEW OF WAP: WAP the wireless world - WAP application architecture - WAP internal structure - WAP versus Web Setting up the WAP: Available software products - WAP resources - The Development toolkits.

UNIT 5   13 Hrs

WAP GATEWAYS: Definition - Functionality of a WAP gateway - The web model versus WAP model Positioning of WAP gateway in the network selecting a WAP gateway. Basic WML: Extensible Markup language - WML Structure - A basic WML card - Text formatting – Navigation Advanced display features.

Books for Study
1. Elliotte Rusty Harold, "XML Bible" IDG Books India, New Delhi, 2004
   Units I , II & III
2. Charles Arehart, Nirmal Chidambaram, Shashi Guru Prasad and Others," Professional WAP", WROX Publications, New Delhi, 2002.
   Units IV & V

Book for Reference
1. Gold forb, "XML Hand Book", Pearson Education, New Delhi,2003
2. Huw Evans, Paul Ashworth, "Getting started with WAP and WML", BPB Publications, New Delhi, 2001.

Sem:III   Hours/week:5
07PIT335   Credit:5

MANAGEMENT INFORMATION SYSTEMS & ERP

AIM

To give an understanding of the importance of Information Systems, how it relates to managerial end-users and the vital role of Information Technology in business and to impart the knowledge on evolution implementation and advantages of an ERP System.

UNIT 1   10 Hrs

INTRODUCTION TO INFORMATION SYSTEMS (IS): Why study IS - why business need Information Technology (IT) - Fundamentals of IS concepts - overview of IS - solving business problems with IS - developing IS solutions.

UNIT 2   12 Hrs

INFORMATION SYSTEMS FOR BUSINESS OPERATIONS: Business IS - Marketing, manufacturing, human resource, accounting and financial information systems - transaction processing system - management information and decision support systems. MANAGING INFORMATION TECHNOLOGY: Managing information resource and technologies - Global IT management - planning and implementing business change with IT.

UNIT 3   14 Hrs

ENTERPRISE RESOURCE PLANNING (ERP): An overview - benefits of ERP - ERP and related technologies - Business process reengineering. ERP IMPLEMENTATION: ERP implementation life cycle - implementation methodology - hidden cost - organizing the implementation - vendors, consultants and users contracts with vendors, consultants and employees project management and monitoring - ERP present and future - ERP and E-commerce - ERP and Internet.

UNIT 4   12 Hrs

FROM E-COMMERCE TO E-BUSINESS: Linking Today's Business with Tomorrow's Technology –e-business – Structural Transformation – e-business Requires Flexible Business Design Challenge Traditional Definition of Value – E-business Trend Spotting: Increase speed of Service – Empower your customer – Provide Integrated Solution, Not piecemeal products – Integrate your sales and service – Ease of Use – Provide Flexible Fulfillment and convenient service delivery – Increase Process visibility.

UNIT 5   12 Hrs

E-BUSINESS DESIGN: Construction an e-business Design – Self Diagnosis – Reversing the Value chain – Choosing a Narrow Focus – Constructing the e-business Architecture: The New Era of Cross – Functional integrated Apps – Aligning the e-business design with application integration – Customer Relationship Management: Defining CRM – The New CRM Architecture – Next-Generation CRM Trends.

Books for Study

1. James A O'Brien, "Management Information Systems for Managing IT in the Internetworked Enterprise", 4th Ed., Tata McGraw Hill, New Delhi, 1999. UNITS I, II
2. Alexis Leon, " ERP Demystified", Tata McGraw Hill, New Delhi, 2000. UNIT III
3. Ravi Kalakota and Marcia Robinson, "e-Business Roadmap for Success", Addision-Wesley, New Delhi, 2000. UNITS IV & V

Book for Reference

1. W.S. Jaswadekar, " Management Information Systems", Tata McGraw Hill, New Delhi, 1998.
2. Kamalesh K Bajaj & Debjani Nag, "E-Commerce- The Cutting Edge of Business", TataMcGraw-Hill, New Delhi, 2000.

Sem:III   Hours/week:3
07PIT336   Credit:2

SOFTWARE LAB - V (ASP & XML)

ASP

1. Sending Server, client & user details [Request & Response] to the client

2. Chatting using Application and session object

3. DB access using Server Object

4. File uploading & downloading using Server object

5. Login form expiry

6. Student Biodata

7. Cookies manipulation

XML

8. Content displaying using XSL,CSS

9. Inter database access

10. XML Manipulation using parser

Sem:III   Hours/week:5
07PIT343   Credit:4

Optional: DATA WAREHOUSING & DATA MINING

AIM
To provide an understanding of the data warehousing and data mining concepts.

UNIT 1   13 Hrs
DATA MINING AND DATA PREPROCESSING: Data Mining – Motivation – Definition –
Data Mining on kind of data – Functionalities – Classification – Data Mining Task Primitives
– Major issues in Data Mining – Data Preprocessing – Definition – Data Clearing –
Integration and Transformation – Data Reduction.

UNIT 2   12 Hrs
DATA WAREHOUSING: Introduction – Multidimensional Data Model – Data Warehouse
Architecture – Data Warehouse Implementation – From data Warehousing to Data Mining –
On Line Analytical Processing – On Line Analytical Mining.

UNIT 3   12 Hrs
FREQUENT PATTERNS, ASSOCIATIONS AND CLASSIFICATION: The Apriori algorithm
– Generating Association rules from frequent item sets – Mining various kinds of association
rules – Definition of Classification and Prediction – Classification by Decision Tree Induction –
Bayesian Classification – Rule Based Classification – Classification by Back Propagation –
Lazy learners – K-Nearest Neighbor Classifier – Other classification methods.

UNIT 4   12 Hrs
CLUSTER ANALYSIS: Definition – Types of data in Cluster Analysis – Categorization of
major Clustering techniques – Portioning Methods – Hierarchical Methods – Agglomerative
and Divisive Hierarchical Clustering – BIRCH – ROCK – Grid Based Methods – Model Based
Clustering Methods – Outlier Analysis.

UNIT 5   13 Hrs
SPATIAL, MULTIMEDIA, TEXT AND WEB DATA: Spatial Data Mining – Multimedia
Data Mining – Text Mining – Mining the World Wide Web – Data Mining Applications –
Social Impacts of Data Mining – Trends in Data Mining.

Books for Study
1. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", 2nd Ed.,
   Morgan Kaufmann Publishers, 2006.
   Ch: 1.1 - 1.4, 1.6, 1.7, 1.9, 2.1, 2.3 – 2.5, 3, 5.2.1, 5.2.2, 5.3, 6.1, 6.3 – 6.6,
   6.9.1, 6.10, 7.1 – 7.5, 7.7, 7.8, 7.11, 10.2 – 10.5, 11.1, 11.4, 11.5.

Book for Reference
1. Margaret H.Dunham, "Data Mining: Introductory and Advanced Topics", Pearson
   Education, 2003.
2. Arun K.Pujari, " Data Mining Techniques", University Press, 2001.

Sem:III   Hours/week:5
07PIT344   Credit:4
Optional: TCP/IP

AIM
To understand the concepts of TCP/IP and their usage in communication network.

UNIT 1   12 Hrs
INTRODUCTION TO TCP: What is TCP/IP network? Role of DARPA - The ARPA evolution - transmission from proprietary network to open TCP/IP - Overview of TCP/IP Networks – TCP/IP Application overview – The Internet. TCP/IP protocol layering concepts: Principles – OSI Model - The DoD model - TCP/IP Implementation Hierarchy.

UNIT 2   13 Hrs
NETWORKING WITH TCP/IP: Network support: TCP/IP on IEEE LANs – Understanding IEEE 802.3 Frames – SNAP Header – TCP/IP on Token Ring Networks - TCP/IP Internetworking infrastructure – IP addressing – what is network addressing - IP address – Special IP address – Assigning IP address.

UNIT 3   12 Hrs
ADDRESS RESOLUTION PROTOCOLS: Need for ARP – ARP Format - ARP operation - Network monitoring with ARP – timeouts in ARP cache table - ARP budget network - Duplicates address and ARP - Protocol Trace for ARP – Reverse Address Resolution protocol: RARP Packet Trace - Internet protocol: IP abstraction – IP Datagram - IP Trace.

UNIT 4   13 Hrs
IP ROUTING & ICMP PROTOCOL: IP Routing Concepts: Basic routing concepts – Datagram delivery – Host and Router - Routing Tables – Processing Datagrams – ICMP Protocol – CMP – ICMP services – ICMP Types and Echo/PING – ICMP type 3 - Destination unreachable, ICMP type 4 – Source quench – ICMP type 5 – Redirect. IP subnetting – Subnetting – Motivation for subnets – Subnet mask – Routing for subnet – IP Routing Protocol - Routing Information Protocol.

UNIT 5   12 Hrs
TCP/UDP: Transfer Protocol – feature - host environment – connection opening and closing – TCP message format-cumulative ACK in TCP - adaptive Timeouts - minimizing Impact TCP - UDP. Automatic Configuration – Dynamic configuration using BOOTP - Dynamic configuration using DHCP – Application services – DNS – Mail – Protocols – Remote Access Protocols – File Access Protocols – Internet Access protocols

Books for Study
1. Karanjit S. Siyan, "Inside TCP/IP", 3rd Ed., Techmedia, New Delhi.
   Ch: 1-13

Book for Reference
1. Behrouz A. Forouzan with Sophia Chung Fegan, "TCP/IP Protocol Suite", 2nd Ed, Tata McGraw-Hill, New Delhi, 2003.
2. Andrew S Tanenbaum , "Computer Networks" , 3rd Ed., Prentice Hall of India, New Delhi, 2005.

EXTRA DEPARTMENT COURSES (EDC)
OFFERED BY THE VARIOUS DISCIPLINES DURING II AND III SEMESTERS

Sem	Code No.	Title of the Paper	Hr	Cr
Department of Biochemistry				
II	07PBI261	Applied Nutrition*	4	3
III	07PBI362	First Aid Management*	4	3
Department of Biotechnology				
II	07PBT261	Basics of Bioinformatics*	4	3
III	07PBT362		4	3
Department of Botany				
II	07PBO261	General Microbiology	4	3
III	07PBO582	Remote Sensing and Geographical Information System	4	3
Department of Chemistry				
II	07PCH261	Environmental Chemistry	4	3
III	07PCH362	Industrial Chemistry	4	3
Department of Commerce				
II	07PCO261	Fundamentals of Accounting for Managers	4	3
III	07PCO362	Principles of Management	4	3
Department of Computer Science				
II	07PCS261	Internet Concepts*	4	3
II	07PCS261	Internet Concepts	4	3
III	07PCS362	Computer Applications for Social Sciences*	4	3
III	07PCS362	Computer Applications for Social Sciences	4	3
Department of Economics				
II	07PEC261	General Economics	4	3
III	07PEC362	Indian Economy	4	3
Department of Electronics				
II	07PEL261	Electronics in Communication*	4	3
III	07PEL362	Computer Hardware*	4	3
Department of English				
II	07PEN261	English for Specific Purposes	4	3
III	07PEN362	Interviews and Group Dynamics	4	3
Department of French				
II	07PFR261	Beginners Course in French	4	3
III	07PFR362	Advanced Course in French	4	3

Department of Hindi

II	07PHI261	Beginners Course in Hindi	4	3
III	07PHI362	Advanced Course in Hindi	4	3

Department of History

II	07PHS261	Public Administration*	4	3
III	07PHS362	Applied Tourism*	4	3

Department of Human Resource Management

II	07PHR261	Sociology for Competitive Examinations	4	3
III	07PHR362	Human Resource Management	4	3

Department of Mathematics

II	07PMA261	Operations Research	4	3
III	07PMA362	Numerical Methods	4	3

Department of Physics

II	07PPH261	Physics for Rural Development	4	3
III	07PPH362	Medical Physics	4	3

Department of Sanskrit

II	07PSA261	Beginners Course in Sanskrit	4	3
III	07PSA362	Advanced Course in Sanskrit	4	3

Department of Statistics

II	07PST261	Statistics for Biomedical Sciences*	4	3
III	07PST362	Data Analysis*	4	3

Department of Tamil

II	07PTA261	Beginners Course in Tamil	4	3
II	07PTA261	அரசுப் பணித்தேர்வுத் தமிழ் - I*		
III	07PTA362	Advanced Course in Tamil	4	3
IIII	07PTA683	அரசுப் பணித்தேர்வுத் தமிழ் - II*	4	3

Non-Departmental Courses

Journalism

II	07PJO261	Beginners Course in Journalism	4	3
III	07PJO362	Advanced Course in Journalism	4	3

Law

II	07PLA261	Beginners Course in Law	4	3
III	07PLA362	Advanced Course in Law	4	3

Shorthand

II	07PSH261	English Shorthand-I	4	3
III	07PSH362	English Shorthand-II	4	3

(* Offered by Self Financing Section)