ACADEMIC REGULATIONS

COURSE STRUCTURE AND SYLLABUS

FOR

M.TECH.
COMPUTER SCIENCE AND ENGINEERING
EFFECTIVE FROM THE ACADEMIC YEAR 2009-10.

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING
(**AUTONOMOUS**)
ACCREDITED BY **NAAC** WITH **A** GRADE WITH A **CGPA** OF **3.47/4.00**
AFFILIATED TO JNTU KAKINADA
MADHURAWADA, VISAKHAPATNAM 530048

Vision

To evolve into and sustain as a Centre of Excellence in Technological Education and Research with a holistic approach.

Mission

To produce high quality engineering graduates with the requisite theoretical and practical knowledge and social awareness to be able to contribute effectively to the progress of the society through their chosen field of endeavor.

To undertake Research & Development, and extension activities in the fields of Science and Engineering in areas of relevance for immediate application as well as for strengthening or establishing fundamental knowledge.

FOREWORD

The autonomy is conferred on any institution by the U.G.C. on the recommendations of the affiliating University and the State Government based on its performance history as well as future commitment and competency to deliver quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the institution. Thus, an autonomous institution is given the freedom to have its own **curriculum, examination system** and **monitoring mechanism**, independent of the affiliating University but under its eagle eyes.

The G.V.P. College of Engineering is proud to win the confidence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, if not improve upon the standards and values it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education of the region. As a follow up, statutory bodies like Academic Council and Boards of studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Kakinada to frame the regulations, Course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several experts taken from academics, industry and research, in accordance with the vision and mission of the college to give a quality engineering graduate to the society.

All the faculties are advised to read, understand, and follow the regulations in letter and spirit. In case of doubts /clarifications, interpretations have to be made carefully and cautiously with elderly guidance. No controversies shall arise in implementation.

All the parents and students are requested to go through carefully and be through. Any clarifications needed are to be sought at appropriate time and with official of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments.

The cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and prospective engineering graduates.

PRINCIPAL

ACKNOWLEDGEMENT

This College took a bold step of asking for autonomy with the encouragement of erstwhile JNTU and the APSCHE gracefully recommended its case to UGC.

The UGC was kind enough to recommend to JNTU to grant autonomy to this college.

The Vice-Chancellor and the Registrar of JNTUK acted with extraordinary speed to make autonomous status a reality and to save one year of autonomy for this college.

Many experts gave their consent and responded at short notice to be part of the most important activity of giving direction to prospective engineering students of this college. They sat through long hours to discuss in depth to make it practicable.

All the faculty consulted several course structures and syllabi to bring out the best. They cooperated in sitting through lengthy meetings till late evenings.

The non-teaching staff toiled through hot summer in typing, printing several drafts before they are finalised. They spent late nights in the college to facilitate the smooth conduct of Board of studies, Academic council and Governing Body meetings.

The management extended all material and moral support to keep up the accelerated time schedules.

All are gratefully acknowledged for strengthening the hands of the administration.

PRINCIPAL

REGULATIONS

The M.Tech Degree of JNTU-KAKINADA shall be conferred on candidates who are admitted to the program and fulfill all the requirements for the award of the Degree.

1.0 ELGIBILITY FOR ADMISSION:

Admission to the above program shall be made subject to the eligibility, qualifications and specialization as per the guidelines prescribed by the State Government and AICTE from time to time.

2.0 AWARD OF M.TECH. DEGREE:

a. A student shall be declared eligible for the award of the M.Tech. degree, if he pursues a course of study and completes it successfully for not less than two academic years and not more than four academic years.

b. A student, who fails to fulfill all the academic requirements for the award of the Degree within four academic years from the year of his admission, shall forfeit his seat in M.Tech course.

c. The duration each semester will normally be 20 weeks with 5 days a week. A working day shall have 7 periods each of 50minutes

3.0   COURSE OF STUDY:

COURSES	INTAKE
M.TECH	
Chemical Engineering	18
Computer science and Engineering	18
CAD/CAM	18
Infrastructural Engineering and Management	18
Power system control and Automation	18
Software Engineering	18

4.0   ATTENDANCE:

The Programs are offered on a unit basis with each subject being considered as a unit.

a. A candidate shall be deemed to have eligibility to write end semester examinations in a subject if he has put in at least 75% of attendance in that subject.

b. Shortage of attendance up to 10% in any subject (i.e. 65% and above and below 75%) may be condoned by a Committee on genuine and valid reasons on representation by the candidate with supporting evidence.

c. A candidate shall get minimum required attendance at least in three (3) theory Subjects in the present semester to get promoted to the next semester. In order to qualify for the award of the M.Tech Degree, the candidate shall complete all the academic requirements of the subjects, as per the course structure.

d. Shortage of attendance below 65% shall in no case be condoned.

e. A stipulated fee shall be payable towards condonation of shortage of attendance.

5.0 EVALUATION:

The Performance of the candidate in each semester shall be evaluated subject-wise, with A minimum of 100 marks for theory and 100marks for practical, on the basis of Internal Evaluation and End Semester Examination.

a. For the theory subjects 60 marks shall be awarded based on the performance in the End Semester Examination, 40 marks shall be awarded based on the Internal Evaluation. The internal evaluation shall be made based on the **average** of the marks secured in the two Mid –Term Examinations of **30 each** conducted one in the middle of the Semester and the other immediately after the completion of instruction. Each mid-term examination shall be conducted for duration of 120 minutes with 3 questions to be answered out of 5 questions. The remaining 10 marks are awarded through an average of continuous evaluation of assignments/seminars/any other method, as notified by the teacher at the beginning of the semester.

b. For Practical subjects, 50 marks shall be awarded based on the performance in the End Semester Examinations, 50 marks shall be awarded based on the day-to-day performance as Internal marks. A candidate has to secure a minimum of 50% to be declared successful.

c. There shall be a seminar presentation during 3rd semester. For seminar, a student under the supervision of a faculty member, shall collect the literature on a topic and critically review the literature and submit it to the Department in a report form and shall make an oral presentation before the Departmental Committee. The Departmental Committee consists of Head of the Department, supervisor and two other senior faculty members of the department. For Seminar there will be only internal evaluation of 50 marks. A candidate has to secure a minimum of 50% to be declared successful.

d. A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures the minimum of 40% of marks in the End Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.

e. In case the candidate does not secure the minimum academic requirement in any subject (as specified in 5.0 d) he has to reappear for the End Examination in that subject. A candidate shall be given one chance to re-register for each subject provided the internal marks secured by a candidate are less than 50% and he has failed in the end examination. In such case candidate must re-register for the subject (s) and secure required minimum attendance. Attendance in the re-registered subject (s) has to be calculated separately to become eligible to write the end- examination in the re-registered subject(s). The attendance of re-registered subject(s) shall be calculated separately to decide upon the eligibility for writing the end examination in those subject(s). In the event of taking another chance, the internal marks and end examination marks obtained in the previous attempt are nullified.

f. In case the candidates secure less than the required attendance in any subject(s), he shall not be permitted to appear for the End Examination in that subject(s). He shall re-register the subject when next offered.

g. Laboratory examination for M.Tech courses must be conducted with two Examiners, one of them being Laboratory Class Teacher and second examiner shall be other than Laboratory Teacher.

6.0 EVALUATION OF PROJECT / DISSERTATION WORK:

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the Project Review Committee.

a. A Project Review Committee (PRC) shall be constituted with Principal as chair person, Heads of all the Departments which are offering the M.Tech programs and two other senior faculty members.

b. Registration of Project Work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the subjects (theory and practical subjects.)

c. After satisfying 6.0 b, a candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work to the Departmental Committee for its approval. Only after obtaining the approval of Departmental Committee the student can initiate the Project work

d. If a candidate wishes to change his supervisor or topic of the project he can do so with approval of Departmental Committee. However, the Departmental Committee shall examine whether the change of topic/supervisor leads to a major change of his initial plans of project proposal. If so, his date of registration for the Project work starts from the date of change of Supervisor or topic as the case may be.

e. A candidate shall submit status report (in a bound-form) in two stages at least with a gap of 3 months between them.

f. The work on the project shall be initiated in the beginning of the second year and the duration of the project is for two semesters. A candidate is permitted to submit Project Thesis only after successful completion of theory and practical course with the approval of PRC not earlier than 40 weeks from the date of registration of the project work. For the approval of PRC the candidate shall submit the daft copy of thesis to the Principal (through Head of the Department) and shall make an oral presentation before the PRC.

g. Three copies of the Project Thesis certified by the supervisor shall be submitted to the College.

h. The thesis shall be adjudicated by one examiner selected by the Chairman, PRC. For this HOD shall submit in consultation with the supervisor a panel of 5 examiners, who are eminent in that field.

i. If the report of the examiner is not favourable, the candidate shall revise and resubmit the Thesis, in the time frame as described by PRC. If the report of the examiner is un-favourable again, the thesis shall be summarily rejected.

j. If the report of the examiner is favourable, viva-voce examination shall be conducted by a board consisting of the supervisor, Head of the Department and the examiner who adjudicated the Thesis. The Board shall jointly report candidates work as:
  A. Excellent
  B. Good
  C. Satisfactory
  D. Unsatisfactory

Head of the Department shall coordinate and make arrangements for the conduct of viva-voce examination. If the report of the viva-voce is unsatisfactory, the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination, he will not be eligible for the award of the degree.

7.0 AWARD OF DEGREE AND CLASS :

A candidate shall be eligible for the respective degree if he satisfies the minimum academic requirements in every subject and secures "satisfactory" or higher grade report on his Thesis/ Dissertation and Viva-voce.

After a student has satisfied the requirements prescribed for the completion of the program and are eligible for the award of M.Tech. Degree he shall be placed in one of the following three classes.

Class Awarded	% of Marks to secured
First Class with Distinction	70% and above
First Class	Below 70% but not less than 60%
Second Class	Below 60% but not less than 50%

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

8.0   WITHHOLDING OF RESULTS:

If the candidate has not paid any dues to the college or if any case of in-discipline is pending against him, the result of the candidate will be withheld and he will not be allowed into the next higher semester. The issue of the degree is liable to be withheld in such cases.

9.0   TRASITORY REGULATIONS:

Candidate who have discontinued or have been detained for want of attendance or who have failed after having undergone the course are eligible for admission to the same or equivalent subjects as and when subjects are offered, subject to 5.0 e and 2.0

10.0   GENERAL

1.   The academic regulations should be read as a whole for purpose of any interpretation.
2.   In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, Academic Council is final.
3.   The College may change or amend the academic regulations and syllabus at any time and the changes / amendments made shall be applicable to all the students with effect from the date notified by the College.
4.   Wherever the word he, him or his occur, it will also include she, hers.

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COURSE STRUCTURE

I SEMESTER:

COURSE CODE	THEORY/LAB	L	P
ACS2101	Design and analysis of algorithms	4	-
ACS2102	Computer Organization	4	-
ACS2103	Computer Communication	4	-
ACS2104	Operating Systems	4	-
ACS2105	Software Engineering	4	-
ACS2106	Database Management Systems	4	-
ACS2107	*Design and analysis of algorithms lab(Through C++)*	-	4
	Total	**24**	**4**

II SEMESTER:

COURSE CODE	THEORY/LAB	L	P
ACS2108	Data Warehousing and Mining	4	-
ACS2109	Embedded Systems	4	-
ACS2110	Network Security and Cryptography	4	-
ACS2111	Object Oriented Analysis and Design	4	-
	Elective-I	4	-
ACS2112	Pattern Recognition and Image Processing		
ACS2113	Neural Networks		
ACS2114	Advanced Computer Architecture		
	Elective-I	4	-
ACS2115	Middleware Technologies		
ACS2116	Mobile Computing		
ACS2117	Software Project Management		
ACS2118	*UML Lab*	-	*4*
	Total	**24**	**4**

III SEMESTER:

COURSE CODE	THEORY/LAB
ACS2119	SEMINAR

IV SEMESTER:

COURSE CODE	THEORY/LAB
ACS2120	**PROJECT WORK** **DISSERTATION / THESIS** EXCELLENT/GOOD/SATISFACTORY/NOT-SATISFACTORY

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: ACS2101   **L   P**
                                                            4   0

UNIT-I
Overview of OOP Principles: Encapsulation, Inheritance, and Polymorphism. Review of C++-Classes and Objects, Class members, Access control, class scope, constructors and destructors, dynamic memory allocation and de-allocation (new and delete), Polymorphism-Function overloading, operator overloading, generic programming-function and class templates, Inheritance, run time polymorphism using virtual functions, abstract classes, File I/O and Exception handling.

UNIT-II
Algorithm Analysis and Review of Data Structures: Algorithms, Psuedo code for expressing algorithms, Performance Analysis-time complexity and space complexity-notation, Omega notation and Theta notation, little o notation, Probabilistic analysis, Amortized analysis, Review of Data Structures- The List ADT, Stack ADT, Queue ADT, Implementations using template class, Hash Functions, Collision Resolution in hashing, Priority queues-Definition, Priority queues-ADT, Heaps-Definition, Insertion and Deletion, Applications-Heap sort, Disjoint sets-Disjoint set ADT, Union and Find algorithms.

UNIT-III
Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's Matrix Multiplication.

UNIT-IV
Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-V
Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Traveling sales person problem, Reliability design.

UNIT-VI
Searching and Traversal Techniques: Efficient non-recursive Tree Traversal algorithms, DFS, BFS of Graphs, AND/OR graphs, game trees, Bi-Connected components, Search Trees- Balanced search trees-AVL trees, representation, Operations-insertion, deletion and searching, B-Trees-B-Tree of order m, Operations- insertion, deletion and searching.

UNIT-VII
Backtracking and Branch and Bound: General method (Backtracking), Applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. General method (Branch and Bound), Applications - Traveling sales person problem, 0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT-VIII
NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP - Hard and NP- Complete classes, Cook's theorem.

Text Books:
1. Computer Algorithms/C++, E.Horowitz, S.Sahani and S.Rajasekharan, Galgotia Publishers pvt. Limited.
2. Data Structures and Algorithm Analysis in C++, 2nd Edition, Mark Allen Weiss, Pearson Education.
3. Introduction to Algorithms, 2nd Edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, PHI Pvt.Ltd./ Pearson Education.

Reference Books:
1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
2. Introduction to the Design and Analysis of Algorithms,A.Levitin Pearson Education.
3. Data structures, Algorithms and Applications in C++, S.Sahni, University press (India) pvt ltd, 2nd edition, Orient Longman pvt.ltd.
4. Object Oriented Programming Using C++, 2nd Edition, I.Pohl, Pearson Education.
5. Fundamentals of Sequential and Parallel Algorithms, K.A.Berman, J. L.Paul, Thomson
6. Data Structures And Algorithms in C++, 3rd Edition, Adam Drozdek, Thomson.
7. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and   R.Tomassia, John Wiley and sons.

COMPUTER ORGANIZATION

Course Code: ACS2102   **L   P**
                                                  4   0

UNIT-I
BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes. COMPUTER ARITHMETIC: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit- Decimal Arithmetic operations.

UNIT-II
REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Mircro operatiaons, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle. Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT-III
MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, microprogram example, design of control unit, Hard wired control. Microprogrammed control

UNIT-IV
PROGRAM AND NETWORK PROPERTIES:
Conditions of Parallelism. Program Partitioning and Scheduling, Program flow Mechanism, System Interconnect Architectures. SCALABILITY AND PERFORMANCE Poricipels of Scalable Performance, Performance Metrics and Measures, Parallel Processing Applications. Speedup Performance Laws. Scalability Analysis and Approaches.

UNIT-V
THE MEMORY SYSTEM: Basic concepts semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID.

UNIT-VI
INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT-VII
PIPELINE AND VECTOR PROCESSING:
Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

UNIT--VIII:
MULTI PROCESSORS: Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration. InterProcessor Communication and Synchronization Cache Coherance. Shared Memory Multiprocessors. MULTIPROCESSING Multiprocessor System Interconnects. Cache Coherence and Synchronization Mechanisms. Vector Processing Principles. SIMD Computer Implementation Models. Larency Hiding Techniques. Principles of Multi Threading. Data Flow Architecture Evaluation.

Text books:
1. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI
2. Computer Organization – Car Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.

Reference:
1. Computer Organization and Architecture – William Stallings
   Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th
   Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, -
   Sivaraama Dandamudi Springer Int. Edition.
4. Computer Organization, Anjaneyulu, Himalaya Pub house.

COMPUTER COMUNICATIONS

Course Code: ACS2103   **L**   **P**
                                                           4   **0**

UNIT-I
Introduction: Uses of computer Networks, Network H/w, Network S/W, Reference Models, Example Networks, Network Standardization.

UNIT-II
Physical Layer: Guided transmission media – Magnetic media, Twisted Pair, coaxial cable, fiber optics. Data Link Layer: Design Issues, Error detection and correction , Elementary Data Link Protocols, Sliding Window Protocols, Protocol Verification, Example Data Link protocols.

UNIT-III
The Medium Access Sub Layer: The channel allocation problem, Multiple access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, Data Link Layer Switching.

UNIT-IV
The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality Of Service, Internet Working, Network Layer in Internet.

UNIT-V
The Transport Protocol: The Transport Service, Elements of transport protocol, A simple Transport Protocol, Internet Transport Protocols UDP, Internet Transport Protocols TCP, Performance Issues.

UNIT-VI
The Application Layer: DNS-(Domain Name System), Electronic Mail, World Wide Web Multimedia,

UNIT-VII
Network Security: Cryptography, Symmetric _key Algorithms, Public–Key Algorithms, Digital Signatures, Management of public keys.

UNIT-VIII
Communication Security, Authentications Protocols, E-mail Security, Web security, Social Issues.

Text books:
1. Computer Networks -- Andrew S Tanenbaum,4th Edition. Pearson Education/PHI.

Reference books:

1. Computer Communications and Networking Technologies – Michael A.Gallo, William M .Hancock –Thomson Publication

2. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

OPERATING SYSTEMS

Course code: ACS2104   **L   P**

                                                           4   0

UNIT-I
Operating System Introduction, Structures - Simple Batch, Multi programmed, time-shared, Personal Computer, Parallel, Distributed Systems ,Real-Time Systems , System components, Operating-System services, System Calls, Virtual Machines, System Design and Implementation.

UNIT-II
Process and CPU Scheduling - Process concepts and scheduling, Operation on processes, Cooperating Processes, Threads, and Interposes Communication Scheduling Criteria, Scheduling Algorithm, Multiple - Processor Scheduling, Real-Time Scheduling.

UNIT-III
Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging. Demand Paging, Performance of demanding Paging, Page Replacement, Page Replacement Algorithm, Allocation of Frames, Thrashing.

UNIT-IV
File System Interface and Implementation -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management, Directory Management, Directory Implementation, Efficiency and Performance. Deadlocks - System Model, Dead locks Characterization, Methods for Handling Dead locks Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

UNIT-V
Process Management and Synchronization - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors.

UNIT-VI
Introduction to Distributed systems: Goals of distributed system, hardware and software concepts, design issues. Communication in Distributed systems: Layered protocols, ATM networks, the Client – Server model, remote procedure call and group communication.

UNIT-VII
Synchronization in Distributed systems: Clock synchronization, Mutual exclusion, E-tech algorithms, the Bully algorithm, a ring algorithm, atomic transactions

UNIT-VIII
Deadlocks: deadlock in distributed systems, Distributed deadlock prevention, and distributed dead lock detection.

Text books:
1 Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
2 Distributed Operating System - Andrew. S. Tanenbaum, PHI

Reference books:
1. Operating System A Design Approach-Crowley,TMH.
2. Operating Systems – Internals and Design Principles Stallings, Fifth Edition–2005,
3. Pearson Education/PHI
4. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI
5. Operating Systems, Dhamdhere, TMH

SOFTWARE ENGINEERING

Course Code: ACS2105   **L   P**

                                             4   0

UNIT-I
Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT-II
Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process. Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT-III
Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT-IV
Design Engineering: Design process and Design quality, Design concepts, the design model. Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT-V
Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution. Performing User interface design:

Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT-VI

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT-VII

Plans for testing: Snooping for information, Coping with complexity through teaming, Testing plan focus areas, Testing for recoverability, Planning for troubles.

UNIT-VIII

Preparing for the tests: Software Reuse, Developing good test programs, Data corruption, Tools, Test Execution, Testing with a virtual computer, Simulation and Prototypes, Managing the Test, Customer's role in testing.

Text books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville , 7th edition, Pearson education.
3. Software Testing Techniques – Loveland, Miller, Prewitt, Shannon, Shroff Publishers & Distribution Pvt Ltd..,

Reference books:

1. Software Engineering- K.K. Agarwal & Yogesh Singh,New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

DATABASE MANAGEMENT SYSTEMS

Course Code: ACS2106   **L   P**
                                                         4   0

UNIT-I
Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor – History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT-II
Relational Model: Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views. Relational Algebra and Calculus: Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT-III
Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOTR – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

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UNIT-IV

Schema refinement – Problems Caused by redundancy– Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – forth Normal Form.

UNIT-V

Overview of Transaction Management: ACID Properties – Transactions and Schedules – Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

UNIT-VI

Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions – Dealing with Dead Locks – Specialized Locking Techniques – Concurrency without Locking.
Crash recovery: Introduction to ARIES – the Log – Other Recovery related Structures – the Write- Ahead Log Protocol – Check pointing – re3covering from a System Crash – Media recovery – Other approaches and Interaction with Concurrency control.

UNIT-VII

Overview of Storage and Indexing: Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning.

UNIT-VIII

Storing data: Disks and Files: - The Memory Hierarchy – Redundant Arrays of Independent – Disks – Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats. Tree Structured Indexing: Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Exendble vs. Liner hashing.

Text books:
1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd dition
2. Data base System Concepts, Silberschatz, Korth, McGraw hill, IV edition.

Reference book:
1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Systems design, Implementation, and Management, Rob & Coronel 5th Edition.Thomson
3. Data base Management System, Elmasri Navrate Pearson Education
4. Data base Management System Mathew Leon, Leon Vikas.
5. Data base Systems, Connoley Pearson education

DESIGN AND ANALYSIS OF ALGORITHMS LAB
(Through C++)

Course Code: ACS2107   **L   P**
                                                            0   4

List of Programmes:

1. Write C++ programs to implement the following using an array.
     a) Stack ADT   b) Queue ADT
2. Write C++ programs to implement the following using a singly
   linked list.
     a) Stack ADT   b) Queue ADT
3. Write C++ program to implement the deque (double ended
   queue) ADT using a doubly linked list.
4. Write a C++ program to perform the following operations:
     a) Insert an element into a binary search tree.
     b) Delete an element from a binary search tree.
     c) Search for a key element in a binary search tree.
5. Write a C++ program to implement circular queue ADT using
   an array.
6. Write a C++ program to implement all the functions of a
   dictionary (ADT) using hashing.
7. Write a C++ program to perform the following operations on B-
   Trees and AVL-trees:
     a) Insertion.   b) Deletion.
8. Write C++ programs for the implementation of bfs and dfs for a
   given graph.
9. Write C++ programs to implement the following to generate a
   minimum cost spanning tree:
     a) Prim's algorithm.   b) Kruskal's algorithm.
10. Write a C++ program to solve the single source shortest path
    problem. (Note: Use Dijkstra's   algorithm).
11. Write C++ program that uses non-recursive functions to
    traverse a binary tree in:
     a) Pre-order.   b) In-order.   c) Post-order.

12. Write C++ programs for sorting a given list of elements in
    ascending order using the following sorting methods:
    a) Quick sort.　　　　　b) Merge sort.
13. Write a C++ program to find optimal ordering of matrix
    multiplication.   (Note: Use Dynamic programming method).
14. Consider the problem of eight queens on an (8x8) chessboard. Two
    queens are said to attack each other if they are on the same row,
    column, or diagonal. Write a C++ program that implements
    backtracking algorithm to solve the problem i.e. place eight non-
    attacking queens on the board.
15. Write a C++ program to find the strongly connected components in a
    digraph.
16. Write a C++ program to implement file compression (and
    uncompression) using Huffman's algorithm.
17. Write a C++ program to implement dynamic programming algorithm
    to solve the all pairs shortest path problem.
18. Write a C++ program to solve 0/1 knapsack problem using the
    following:
    a) Greedy algorithm.
    b) Dynamic programming algorithm.
    c) Backtracking algorithm.
    d) Branch and bound algorithm.
19. Write a C++ program that uses dynamic programming algorithm to
    solve the optimal binary search tree problem.
20. Write a C++ program for solving traveling sales persons problem
    using the following:
    a) Dynamic programming algorithm.
    b) The back tracking algorithm.
    c) Branch and Bound.

Suggested Books for lab:

Data Structures, A Pseudocode Approach with C++, Richard F.Gilberg,
Behrouz A.Forouzan, Thomson. Data Structures Using C++, D.S.Malik,
Thomson.

DATA WAREHOUSING AND MINING

Course Code: ACS2108   **L   P**
                                                          4   0

UNIT-I
Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining,

UNIT-II
Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, Online Data Storage.

UNIT-III
Data Mining Primitives, Languages, and System Architectures: Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems,

UNIT-IV
Concepts Description: Characterization and Comparison: Data Generalization and Summarization- Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.

UNIT-V
Mining Association Rules in Large Databases: Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from

Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT--VI
Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

UNIT-VII
Cluster Analysis Introduction :Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

UNIT-VIII
Mining Complex Types of Data: Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

Text books:
1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.
2. Data Mining Techniques – ARUN K PUJARI, University Press
3. Building the DataWarehouse- W. H. Inmon, Wiley Dreamtech India Pvt. Ltd..

Reference books:
1. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
2. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION
3. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION
4. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION

EMBEDDED SYSTEMS

Course Code: ACS2109   **L   P**
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UNIT- I
Embedded Computing: Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples

UNIT-II
The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts.

UNIT-III
Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.

UNIT-IV
Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.

UNIT-V
Applications: Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication.

UNIT-VI
Introduction to Real – Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT-VII

Basic Design Using a Real-Time Operating System: Principles, Semaphores and Queues, Hard Real- Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.

UNIT-VIII

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller.

Text Books:
1. Computers and Components, Wayne Wolf, Elseveir.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.
3. An Embedded Software Primer, David E. Simon, Pearson Education.

Reference Books:
1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.

NETWORK SECURITY AND CRYPTOGRAPHY

Course Code: ACS2110   **L   P**
                                                            4   0

UNIT-I
Introduction: Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork security. Classical Techniques: Conventional Encryption model, Steganography, Classical Encryption Techniques.

UNIT-II
Modern Techniques: Simplified DES, Block Cipher Principles, Data Encryption standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of operations. Algorithms: Triple DES, International Data Encryption algorithm, Blowfish, RC5, CAST-128, RC2, Characteristics of Advanced Symmetric block cifers.

UNIT-III
Conventional Encryption: Placement of Encryption function, Traffic confidentiality, Key distribution, Random Number Generation. Public Key Cryptography: Principles, RSA Algorithm, Key Management, Diffie-Hellman Key exchange, Elliptic Curve Cryptograpy.

UNIT-IV
Number theory: Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms. Message authentication and Hash functions: Authentication requirements and functions, Message Authentication, Hash functions, Security of Hash function and MACs.

UNIT-V

Hash and Mac Algorithms: MD File, Message digest Algorithm, Secure Hash Algorithm, RIPEMD-160, HMAC. Digital signatures and Authentication protocols: Digital signatures, Authentication Protocols, Digital signature standards.

UNIT-VI

Authentication Applications: Kerberos, X.509 directory Authentication service. Electronic Mail Security: Pretty Good Privacy, S/MIME.

UNIT-VII

IP Security: Overview, Architecture, Authentication, Encapsulating Security Payload, Combining security Associations, Key Management. Web Security: Web Security requirements, Secure sockets layer and Transport layer security, Secure Electronic Transaction.

UNIT--VIII

Intruders, Viruses and Worms: Intruders, Viruses and Related threats. Fire Walls: Fire wall Design Principles, Trusted systems.

Text Books:

1. Cryptography and Network Security: Principles and Practice – William Stallings, Pearson Education.
2. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.

Reference Books:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Principles of Information Security, Whitman, Thomson.
4. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
5. Introduction to Cryptography, Buchmann, Springer.

OBJECT ORIENTED ANALYSIS AND DESIGN

Course Code: ACS2111   **L   P**
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UNIT-I
Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT-II
Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT-III
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT-IV
Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

UNIT-V
Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT-VI
Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-VII
Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT-VIII
Case Study: The Unified Library application

Text books:
1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

Reference books:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.
3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
4. Mark Priestley: Practical Object-Oriented Design with UML,TATA McGrawHill
5. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

PATTERN RECOGNITION AND IMAGE PROCESSING

Course Code: ACS2112   **L   P**
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UNIT-I
Introduction: Machine perception, pattern recognition example, pattern recognition systems, the design cycle, learning and adaptation (Text book-1, p.nos: 1-17) Bayesian Decision Theory : Introduction, continuous features – two categories classifications, minimum error-rate classification- zero–one loss function, classifiers, discriminant functions, and decision surfaces (Text book-1, p.nos: 20-27, 29-31).

UNIT-II
Normal density: Univariate and multivariate density, discriminant functions for the normal density different cases, Bayes decision theory – discrete features, compound Bayesian decision theory and context (Text book-1, p.nos: 31-45, 51-54,62-63).

UNIT--III
Maximum likelihood and Bayesian parameter estimation: Introduction, maximum likelihood estimation, Bayesian estimation, Bayesian parameter estimation–Gaussian case (Text book-1, p.nos: 84-97).

UNIT-IV
Un-supervised learning and clustering: Introduction, mixture densities and identifiability, maximum likelihood estimates, application to normal mixtures, K-means clustering. Date description and clustering–similarity measures, criteria function for clustering (Text book-1, p.nos: 517 – 526, 537 – 546).

UNIT-V
Pattern recognition using discrete hidden Markov models:
Discrete-time Markov process, Extensions to hidden Markov models, three basic problems of HMMs, types of HMMs

UNIT-VI
Continuous hidden Markov models: Continuous observation densities, multiple mixtures per state, speech recognition applications.

UNIT-VII
Digital image fundamentals:
Introduction, an image model, sampling and quantization, basic relationships between pixels, image geometry
Image enhancement:
Back ground, enhancement by point processing histogram processing, spatial filtering, introduction to image transforms, image enhancement in frequency domain.

UNIT-VIII
Image Segmentation and Edge Detection: Region Operations, Crack Edge Detection, Edge Following, Gradient operators, Compass and laplace operators. Threshold detection methods, optimal thresholding, multispectral thresholding, thresholding in hierarchical data structures; edge based image segmentation edge image thresholding, edge relaxation, border tracing, border detection,

Text Books:
1. Pattern classifications, Richard O. Duda, Peter E. Hart, David G. Stroke. Wiley student edition, Second Edition.
2. Fundamentals of speech Recognition, Lawerence Rabiner, Biing Hwang Juang Pearson education.
3. R.C Gonzalez and R.E. Woods, "Digital Image Processing", Addison Wesley, 1992.

Reference Books:

1. A.K.Jain, "Fundamentals of Digital Image Processing", Prentice Hall of India.
2. Digital Image Processing – M. Anji Reddy, BS Publications.
3. Pattern Recognition and Image Analysis – Earl Gose, Richard John baugh, Steve Jost PHI 2004

NEURAL NETWORKS

Course Code: ACS2113   **L**   **P**
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UNIT-I
INTRODUCTION - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

UNIT-II
LEARNING PROCESS – Error Correction learning, Memory based learning, Hebbian learing, Competitive, Boltzmann learning, Credit Asssignment Problem, Memory, Adaption, Statistical nature of the learning process,

UNIT-III
SINGLE LAYER PERCEPTRONS – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment

UNIT-IV
MULTILAYER PERCEPTRON – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Comuter experiment, feature detection,

UNIT-V
BACK PROPAGATION - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.

UNIT-VI
SELF ORGANIZATION MAPS – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification

UNIT-VII
NEURO DYNAMICS – Dynamical systems, stavility of equilibrium states, attractors, neurodynamical models , manipulation of attarctors as a recurrent network paradigm

UNIT-VIII
HOPFIELD MODELS – Hopfield models, computer experiment I

Text books:

1. Neural networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2nd edition 2004

Reference Books
1. Artifical neural networks - B.Vegnanarayana Prentice Halll of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
3. Neural networks James A Freeman David M S kapura pearson education 2004

ADVANCED COMPUTER ARCHITECTURE

Course Code: ACS2114

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UNIT-I
Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

UNIT-II
Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler

UNIT-III
Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP

UNIT-IV
ILP software approach- compiler techniques- static branch protection- VLIW approach- H.W support for more ILP at compile time- H.W verses S.W solutions

UNIT-V
Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

UNIT-VI
Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

UNIT-VII

Storage systems- Types – Buses - RAID- errors and failures- bench marking a storage device- designing a I/O system.

UNIT-VIII

Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters-designing a cluster

Text Books:

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

Reference:

1. "Computer Architecture and parallel Processing" Kai Hwang and A.Briggs International Edition McGraw-Hill.

2. Advanced Computer Architectures, Dezso Sima, Terence Fountain,   Peter Kacsuk, Pearson.

MIDDLEWARE TECHNOLOGIES

Course Code: ACS2115   **L   P**
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UNIT-I
Introduction to client server computing: Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

UNIT-II
CORBA with Java: Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web: CORBA with Java.

UNIT-III
Introducing C# and the .NET Platform; Understanding .NET assemblies; Object –Oriented Programming with C#; Callback Interfaces, Delegates, and Events.

UNIT-IV
Building c# applications: Type Reflection, Late Binding, and Attribute-Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services.

UNIT-V
Core CORBA / Java: Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multi count.

UNIT-VI

Existential CORBA: CORBA initialization protocol, CORBA activation services, CORBAIDL mapping CORBA java- to- IDL mapping, The introspective CORBA/Java object.

UNIT-VII

Java Bean Component Model: Events, properties, persistency, Introspection of beans, CORBA Beans

UNIT--VIII:

EJBs and CORBA: Object transaction monitors CORBA OTM's, EJB and CORBA OTM's, EJB container frame work, Session and Entity Beans, The EJB client/server development Process The EJB container protocol, support for transaction EJB packaging EJB design Guidelines.

Text Books:
1 Client/Server programming with Java and CORBA Robert Orfali
   and Dan Harkey, John Wiley & Sons, SPD 2nd Edition
2 Java programming with CORBA 3rd Edition, G.Brose, A Vogel
   and K.Duddy, Wiley-dreamtech, India John wiley and sons
3 C# and the .NET Platform Andrew Troelsen, Apress Wiley-
   dreamtech, India Pvt Ltd

Reference: Books:
1. Distributed Computing, Principles and applications, M.L.Liu,
   Pearson Education
2. Client/Server Survival Guide 3rd edition Robert Orfali Dan
   Harkey and Jeri Edwards, John Wiley & Sons
3. Client/Server Computing D T Dewire, TMH.
4. IBM Webspere Starter Kit Ron Ben Natan Ori Sasson, TMh,
    New Delhi
5. Programming C#, Jesse Liberty, SPD-O'Reilly.
6. C# Preciesely Peter Sestoft and Henrik I. Hansen, Prentice Hall
   of India
7. Intoduction to C# Using .NET Pearson Education
8. C# How to program, Pearson Education

MOBILE COMPUTING

Course Code: ACS2116   **L   P**
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UNIT-I
Introduction to Mobile Communications and Computing: Mobile Computing (MC): Introduction to MC, novel applications, limitations, and architecture GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT- II
(Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT-III
Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

UNIT-IV
Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT-V
Database Issues:Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT-VI

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT-VII

Mobile Ad hoc Networks (MANETs):Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

UNIT-VIII

Protocols and Tools: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

Text Books:
1) Jochen Schiller, "Mobile Communications", *Addison-Wesley*. (Chapters 4, 7, 9, 10, 11), second edition, 2004.
2) Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", *Wiley*, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

Reference Books:
1) Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,

2) Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden , Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3) Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", *Springer*, second edition, 2003.
4) Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003

SOFTWARE PROJECT MANAGEMENT

Course Code: ACS2117   **L   P**
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UNIT-I
Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT-II
Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT-III
The old way and the new: The principles of conventional software engineering, principles of modern software management, transitioning to an iterative process. Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

UNIT-IV
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts. Model based software architectures: A Management perspective and technical perspective.

UNIT-V
Flows of the process: Software process workflows, Inter trans workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Interactive Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction planning process, Pragmatic planning.

UNIT-VI

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations. Process Automation: Automation Building Blocks, the Project Environment.

UNIT-VII

Project Control and Process instrumentation: The server care Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Tailoring the Process: Process dicriminants, Example.

UNIT-VIII

Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.
Case study: The Command Center Processing and Display System-Replacement(CCPDS-R).

Text Book :
1. Walker Rayce : Software Project Management, Pearson Education, 2005.

Reference Books :
1. Richard H.Thayer : Software Engineering Project Management, IEEE Computer Society, 1997.
2. Shere K.D. : Software Engineering and Management, Prentice Hall, 1988.

UML LAB

Course Code: ACS2118   **L   P**
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1. The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

2. Student has to take up another case study of his/her own interest and do the same what ever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned in theory syllabus can be referred for some idea.

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