ANNAMACHARYA INSTITUTE OF TECHNOLOGY ANDSCIENCES::RAJAMPET

(AUTONOMOUS)

www.aitsrajampet.ac.in

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ACADEMIC REGULATIONS (R17)

AND

COURSE STRUCTURE & SYLLABI

For the students admitted to M.Tech Regular Two Year P.G. Degree Course

From the Academic Year 2017-18

M. Tech., COMPUTER SCIENCE & ENGINEERING

VISION AND MISSION OF THE INSTITUTION

Vision

We impart futuristic technical education and instil high patterns of discipline through our dedicated staff who set global standards, making our students technologically superior and ethically strong, who in turn shall improve the quality of life of the human race.

Mission

Our mission is to educate students from the local and rural areas and from other states so that they become enlightened individuals, improving the living standards of their families, industry and society. We provide individual attention, world-class quality of Technical education and take care of character building.

VISION AND MISSION OF THE DEPARTMENT

Vision

To offer advanced subjects in a flexible curriculum which will evolve our graduates to be competent, responding successfully to career opportunities to meet the ongoing needs of the industry. To progress as a Centre of excellence adapting itself to the rapid developments in the field of computer science by performing a high-impact research and teaching environment.

Mission

To impart high quality professional training in postgraduate and undergraduate level with strong emphasis on basic principles of Computer Science and Engineering.To provide our students state-of-the-art academic environment and make unceasing attempts to instil the values that will prepare them for continuous learning.To empower the youth in surrounding rural area with basics of computer education making them self-sufficient individuals.To create teaching-learning environment that emphasizes depth, originality and critical thinking fostering leading-edge research in the ever-changing field of computer science.

Index

ACADEMIC REGULATIONS

M. Tech, Two Year Degree Programme

(For the batches admitted from the academic year 2017-18)

The following rules and regulations will be applicable for the batches of Two year

M.Tech. degree admitted from the academic year 2015-16 onwards.

1.ELIGIBILITY FOR ADMISSIONS:

Admission to the above programme shall be made subject to the eligibility, qualifications and specialization prescribed by the competent authority for each programme, from time to time.

Admissions shall be made either on the basis of merit rank obtained by the qualifying candidates at an Entrance Test conducted by the University or on the basis of GATE/PGECET score, subject to reservations or policies framed by the Government of Andhra Pradesh policies from time to time.

2.ADMISSION PROCEDURE:

As per the existing stipulations of AP State Council for Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year as follows

a) Category-A seats are to be filled by Convenor through PGECET/GATE score.
b) Category-B seats are to be filled by Management as per the norms stipulated by Government of A. P.

3. SPECIALIZATION:

The following specializations are offered at present for the M.Tech. programme.

Sl. No.	**Specialization**
1.	CAD/CAM
2	Machine Design
2.	Digital Electronics and Communication Systems
3.	Embedded Systems
4.	VLSI System Design
5.	Computer Science and Engineering
6.	Electrical Power Engineering
7.	Electrical Power Systems
8	Structural Engineering

and any other specialization as approved by the concerned authorities from time to time.

4. COURSE WORK:

4.1. A Candidate after securing admission must pursue the M. Tech. programme of study for four semesters duration.

4.2. Each semester shall be of 20 weeks duration including all examinations.

4.3. A candidate admitted in to the programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

5. ATTENDANCE

5.1. A candidate shall be deemed to have eligibility to write end semester examinations if he has put in at least 75% of attendance aggregate in all subjects/courses in the semester.

5.2. Condonation of shortage of attendance up to 10% i.e., between 65% and above and less than 75% may be granted by the Institute Academic committee.

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

5.4. Condonation of shortage of attendance shall be granted only on genuine and valid reasons on representation by the candidate with supporting evidence.

5.5. A stipulated fee shall be payable towards condonation of shortage of attendance to the institute as per following slab system

1st Slab: Less than 75% attendance but equal to or greater than 70% a normal condonation fee can be collected from the student.

2nd Slab: Less than 70% but equal to or greater than 65%, double the

condonation fee can be collected from the student.

5.6. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled for that semester.

5.7. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current semester, as applicable.

5.8. A student detained due to shortage of attendance, will have to repeat that semester when offered next.

6. CREDIT SYSTEM NORMS:

TABLE 1

	Period(s)/week	**Credits**
Theory	01	01
Practical	03	02
Technical Seminar	01	01
Project	-	16

7. EVALUATION:

7.1 Distribution of marks

S. No	**Examination**	**Marks**	**Examination and Evaluation**	**Scheme of Evaluation**

S. No	Examination	Marks	Examination and Evaluation		Scheme of Evaluation
1.	Theory	60	Semester-end examination (External evaluation)		The question paper shall be of descriptive type with 5 questions with internal choice are to be answered in 3hours duration of the examination.
		40	Mid - Examination of 120 Min. duration (Internal evaluation). 4 descriptive type questions with internal choice are to be answered and evaluated for 30 marks, and the reaming 10 marks are to be allotted for 3-5 assignments to be submitted by the student. The assignment marks are to be awarded based on the completeness of the assignment, correctness of the assignment and in-time submission, evaluated for 10 marks and average of the total assignment marks are rounded to the next integer.		Two mid-exams 30 marks each are to be conducted. Better one to be considered. **Mid-I:** After first spell of instructions (I&II Units). **Mid-II:** After second spell of instructions (III-V Units).
2	Laboratory	60	Semester-end Lab Examination (External evaluation)		**For laboratory courses: 3** hours duration. One External and One Internal examiners.
		40	30	Day to Day evaluation (Internal evaluation)	Performance in laboratory experiments.
			10	Internal evaluation	Practical Tests (one best out of two tests includes viva-voce)

S. No	Examination	Marks	Examination and Evaluation		Scheme of Evaluation
3	Technical Seminar in each of the semesters. 2 hours /week	100	Internal Evaluation 20 Marks for Report 20 Marks for subject content 40 Marks for presentation 20 Marks for Question and Answers		Continuous evaluation during a semester by the Departmental Committee (DC)
4	Project work	Grade A (95%) Grade B (85%)	12 credits	External evaluation	End Project Viva-Voce Examination by Committee as detailed under sect. 9.
			4 credits	Internal evaluation	Continuous evaluation by the DC. as detailed under sect. 9.5

7.2 A candidate shall be deemed to have secured the minimum academic requirement in a subject/practical if he secures a 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.

7.3 A candidate has to secure a minimum of 50% to be declared successful.

7.4 In case the candidate does not secure the minimum academic requirement in any of the subjects/practical, he has to reappear for the Examination either supplementary or regular in that subject/practical along with the next batch students. A separate supplementary examinations will be conducted for the I semester students at the end of II semester.

7.5 **Revaluation / Recounting:** Students shall be permitted to request for recounting/ revaluation of the end theory examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records are updated with changes if any and the student will be issued a revised memorandum of marks. If there areno changes, the student shall be intimated the same through a letter or a notice.

8. RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL EVALUATION MARKS(for theory subjects only):

8.1 Out of the subjects the candidate has failed in the examination due to internal evaluation marks secured being less than 50%, the candidate shall be given one chance for each theory subject and for a maximum of **Three** theory subjects for improvement of internal evaluation marks.

8.2 The candidate can re-register for the chosen subjects and fulfill the academic requirements. Re-registration shall not be permitted after the commencement of class work for that semester. The candidate can re-register for 1st semester subjects when he is in his 3rd semester and for 2nd semester subjects when he is in his 4th semester else the candidate can re-register after completion of 2 years course work.

8.3 For each subject re-registered, the candidate has to pay a fee equivalent to one third of the semester tuition fee.

8.4 In the event of re-registration, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for those subjects stand cancelled.

9. EVALUATION OF PROJECT WORK:

Every candidate shall be required to submit thesis/dissertation after taking up a topic approved by the Departmental Committee.

9.1 The Departmental Committee (DC) consisting of HOD, Project supervisor and two internal senior experts shall monitor the progress of the project work. A Project Review Committee (PRC) shall be constituted with Principal as Chair Person, Heads of the departments of the M.Tech Programs and Two other senior faculty members, as members of the PRC. PRC will come into action when the DC is not able to resolve the issues.

9.2 Registration of Project work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory, practical and seminar of I& II semesters).

9.3 After satisfying 9.2, a candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work to the DC for approval. Only after obtaining the approval of DC, the student can initiate the project work.

9.4 The work on the project shall be initiated in the penultimate semester and continued in the final semester. The duration of the project is for two semesters. The candidate can submit Project thesis with the approval of DC after 36 weeks from the date of registration at the earliest but not later than one calendar year from the date of registration for the project work. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.

9.5 The Internal Evaluation shall be made by the DC to grade, on the basis of two seminars presented by the student on the topic of his project.

9.6 The student must submit status report at least in two different phases during the project work period. These reports must be approved by the DC before submission of the Project Report.

9.7 A candidate shall be allowed to submit the thesis / dissertation only after passing all the prescribed subjects (theory, practical, seminar and project work internal evaluation).

9.8 A candidate has to prepare four copies of the thesis/dissertation certified in the prescribed format by the supervisor and HOD. Out of which three copies shall be submitted in the examination section.

9.9 Viva-voce examination shall be conducted by a board consisting of the supervisor, Head of the department and the examiner. The board shall jointly report candidate's work as.

A Very Good performance

B Moderate Performance

C Failure Performance

Head of the Department shall coordinate and make arrangements for the conduct of viva-voce.

If the report of the viva-voce is failure performance, 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.

10. CREDIT POINT AVERAGE AND CUMULATIVE CREDIT POINT AVERAGE:

10.1.CREDIT POINT AVERAGE (CPA):

$$\textbf{CPA} = \frac{\sum_i C_i T_i}{10 \sum_i C_i}$$

Where C_i= Credits earned for Course i in any semester/year.

T_i= Total marks obtained for course i in any semester/year.

10.2.CUMULATIVE CREDIT POINT AVERAGE (CCPA):

$$\textbf{CCPA} = \frac{\sum_n \sum_i C_{ni} T_{ni}}{10 \sum_n \sum_i C_{ni}}$$

Where ***n*** refers to the semester in which such courses were credited.

The CCPA is awarded only when a student earns all the credits prescribed for the programme.

10.3. OVERALL PERFORMANCE:

CCPA	Classification of Final Results
7.0 and above	First Class with Distinction
6.0 and above but below 7.0	First Class
5.0 and above but below 6.0	Second Class

11.TRANSCRIPTS:

After successful completion of the entire programme of study, a transcript containing performance of all the academic years will be issued as a final record. Duplicate transcripts will be issued if required, after payment of requisite fee. Partial transcript will also be issued up to any point of study to a student on request.

12. ELIGIBILITY:

A student shall be eligible for the award of M.Tech Degree if he fulfills all the following conditions:

i. Registered and successfully completed all the components prescribed in the programme of study to which he was admitted.
ii. Successfully acquired all **72 credits** as specified in the curriculum corresponding to the branch of his study within the stipulated time.
iii. No disciplinary action is pending against him.

13. AWARD OF DEGREE:

The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendations of the Principal, AITS (Autonomous) based on the eligibility as mentioned in clause 11.

14. WITHHOLDING OF RESULTS:

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

15. TRANSITORY REGULATIONS:

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course in earlier regulations and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered. Whereas, he continues to be in the academic regulations he was first admitted.

16. AMENDMENTS OF REGULATIONS:

The Chairman, Academic Council of Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations and/or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

17. GENERAL:

Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.

18. Any legal issues are to be resolved in Rajampet Jurisdiction.

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
(AN AUTONOMOUS INSTITUTION)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Regulations: **R17** Programme Code: **P3**

I Year M. Tech., I Semester

Subject Code	Subject Name	Hours/ Week		
		L	P	C
7P3111	Fundamentals of Data Science	4	0	4
7P3112	Advanced Data Structures and Algorithms	4	0	4
7P3113	Distributed Databases	4	0	4
7P3114	Advanced Computer Architecture	4	0	4
7P3115	Advanced Software Engineering	4	0	4
7P3116	Computer Networks & its Security	4	0	4
7P3117	Technical Seminar – I	0	0	2
7P3118	Software Laboratory-1	0	3	4
	Total	**24**	**3**	**30**

I Year M. Tech., II Semester

Subject Code	Subject Name	Hours / Week			C
		L	T	P	
7P3121	Big data & Data Analytics	4	0	4	
7P3122	Advances in Software Testing	4	0	4	
7P3123	Software Architecture and Design Patterns	4	0	4	
7P3124	Distributed Operating Systems	4	0	4	
	Elective – I	4	0	4	
	Elective – II	4	0	4	
7P312B	Technical Seminar – II	0	0	2	
7P312C	Software Laboratory-2	0	3	4	
	Total	**24**	**3**	**30**	

Note: L - Lecture; T-Tutorial; P – Practical; C – Credits

List of Electives		Course code
Elective – I	Machine Learning	7P3125
	Grid and Cluster Computing	7P3126
	Cloud Computing	7P3127
Elective – II	Internet of Things	7P3128
	Android Application Development	7P3129
	Network Management Systems	7P312A

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Regulations: **R15** Programme Code: **P3**

II Year M. Tech., III & IV Semester

Subject Code	Subject Name	C
7P3131	Project	16

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3111) Fundamentals of Data Science

Course Objective:

- To understand what is statistical learning and R basics.
- To different various Regression Model
- To analyze the basic concepts data warehouse

Course Outcomes:

At the end of this course the students will be able:

- To understand what is statistical learning and R basics.
- To different various Regression Model
- To write comparison of classification Methods
- To remember programming for basic computational methods
- To analyze the basic concepts data warehouse

UNIT - I

Introduction, What Is Statistical Learning?, Why Estimate f?, How Do We Estimate f?, The Trade-Off Between Prediction Accuracy and Model Interpretability, Supervised Versus Unsupervised Learning, Regression Versus Classification Problems, Assessing Model Accuracy, Measuring the Quality of Fit, The Bias-Variance Trade-of, The Classification Setting, Introduction to R, Basic Commands, Graphics, Indexing Data, Loading Data, Additional Graphical and Numerical Summaries.

UNIT – II

Linear Regression, Simple Linear Regression, Multiple Linear Regression, Other Considerations in the Regression Model, Comparison of Linear Regression with K-Nearest Neighbors, Linear Regression.

UNIT-III

Classification, Logistic Regression, Linear Discriminate Analysis, A Comparison of Classification Methods, Logistic Regression, LDA, QDA, and KNN.

UNIT- IV

Programming for basic computational methods such as Eigen values and Eigen vectors, sparse matrices, QR and SVD, Interpolation by divided differences.

Data Wrangling: Data Acquisition, Data Formats, Imputation, The split-apply-combine paradigm.

UNIT-V

Data Objects and Attribute Types, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity and Dissimilarity.

Data Warehouse: Basic Concepts, Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-Oriented Induction.

Text Books:

1. Gareth James Daniela Witten Trevor Hastie, Robert Tibshirani, An Introduction to Statistical Learning with Applications in R, February 11, 2013, web link: www.statlearning.com.
2. Mark Gardener, Beginning R The statistical Programming Language, Wiley, 2015.
3. Han , Kamber, and J Pei, Data Mining Concepts and Techniques, 3rd edition, Morgan Kaufman, 2012.

References:

1. Sinan Ozdemir, Principles of Data Science, Packt Publishing Ltd Dec 2016.
2. Joel Grus, Data Science from Scratch, Oreilly media, 2015.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes versus Program Outcomes Mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**
CO1		-	-
CO2		-	3
CO3		-	3
CO4		-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3112) ADVANCED DATA STRUCTURES AND ALGORITHMS

Course Objectives:

The Primary Objectives of this course is as follows:

- To **learn** the basic concepts data structures.
- To **define** the Abstract Data Types for Data Structures like Dictionaries and Priority Queues
- To **construct** the nodes of Search Trees like BST, AVL trees, and B-Trees with ADTs
- To **apply** the Searching and Traversal Techniques like DFS, BFS
- To **develop** the dynamic programming methods, Backtracking methods, and Branch & Bound methods

Course Outcomes:

After the completion of this course, the student will be:

1. Able to **understand** the basic concepts data structures.
2. Able to **understand** and **apply**the Abstract Data Types for Advanced Data Structures like Dictionaries and Priority Queues
3. Able to **apply** and **analyze**the nodes of Search Trees like BST, AVL trees, and B-Trees with operations
4. Able to **use**the Searching and Traversal Techniques like DFS, BFS
5. Able to **develop** the dynamic programming methods, Backtracking methods, and Branch & Bound methods

UNIT I : Overview of Data Structures - Arrays, Stacks, Queues, linked lists , Linked stacks and Linked queues, Applications

Algorithm Analysis - Efficiency of algorithms, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs.

UNIT II: Trees and Graphs – Basics of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs, representation and traversals.

Binary Search Trees, AVL Trees and B Trees - Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.

UNIT III: Red – Black Trees, Splay Trees and Hash Tables - Red–Black Trees, Splay Trees and their applications, Hash Tables, Hash Functions and various applications, File Organizations.

UNIT IV: Divide – and – Conquer & Greedy Method - General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication,

Greedy Method- General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

Back Tracking and Branch – and – Bound - General Method, 8 – Queen's Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

UNIT V: Dynamic Programming - General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 /1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

Text Books:

1. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.

References:

1. Data Structures and Algorithms Using C++ by Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education, 2010.
2. Classic Data Structures by D. Samanta, 2005, PHI
3. Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	-	-	**3**
CO2	**3**	-	**3**
CO3	**3**	**3**	-
CO4	**3**	**3**	**3**
CO5	**3**	**3**	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3113)DISTRIBUTED DATABASES

Course Objectives:

- To understand the basic concepts of Distributed data bases.
- To analyze Query Processing, decomposition, distributed query optimization, distributed DBMS Reliability

Course Outcomes:

At the end of the course students should be able to:

- Define the basic concept of distributed database system.
- Identify the importance of distributed database management system architecture and design.
- analyze query Processing and decomposition
- Justify query optimization and transaction management.
- assess distributed database management system reliability

UNIT I

Introduction, Distributed Data Processing, Distributed Database System, Promises of DDBS, Problem areas.Overview of Relational DBMS: Relational Database Concepts, Normalization, Integrity rules, Relational data languages.

UNIT II

Distributed DBMS Architecture: ArchitecturalModels for Distributed DBMS, DDBS Architecture.
Distributed Database Design: Alternative Design Strategies, Distribution Designissues, Fragmentation,Allocation.

UNIT III

Query Processing and decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT IV

Distributed query Optimization: Query optimization, centralized query, optimization, Distributed query optimization algorithms.
Transaction Management: Definition, properties of transaction, types of transactions. Distributed concurrency control: Serializability, concurrency control Mechanisms &Algorithms, Time stamped & Optimistic concurrency control Algorithms, Deadlock Management.

UNIT V

Distributed DBMS Reliability: Reliability concepts and Measures, fault-tolerance in Distributed systems, failures in Distributed DBMS, local & Distributed Reliability Protocols, site failures and Network partitioning. Parallel Database Systems: Database Series, Parallel Architecture, Parallel DBMS Techniques, Parallel exception problems, Parallel Execution for Hierarchical architecture.

TextBooks:

1. M.Tamer OZSU and PatuckValduriez: Principles of Distributed Database Systems,PearsonEdn.Asia,2001.
2. StefanoCeriandWillipsePelagatti: Distributed Databases, McGraw Hill.

REFERENCES:

1. Henry F Korth, A Silberchatz and Sudershan : Database System Concepts, MGH
2. Raghuramakrishnan and JohhanesGehrke: Database Management Systems,MGH

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes versus Program Outcomes Mapping

COURSE OUTCOMES	PO1	PO2	PO3
CO1	-	-	-
CO2	-	-	3
CO3	-	-	3
CO4	-	-	3
CO5	-	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3114) ADVANCED COMPUTER ARCHITECTURE

Course Objectives:

- To learn Program, Network Properties of various parallel computer models.
- To know about new trends in Operating and designing various parallel computers.

Course Outcomes

- Able to calculate performance measures of different parallel computers.
- Able to find the difference between parallel computer with and without shared-memory organization.
- Able to design Instruction Pipeline and able to pass message's using system interconnect.
- Able to find out differences between properties of Data Flow Architectures and other types.
- Able to know about design issues of a processor and the parallelism used in various advanced processors.

UNIT I

Parallel Computer Models: - The state of computing-Multiprocessors and Multi computers-Multivector and SIMD Computers-PRAM and VLSI Models- Architectural Development tracks.

Program and Networks Properties: - Conditions of Parallelism- Program Partitioning and Scheduling- Program Flow Mechanisms-System Interconnect Architectures.

Principles of Scalable Performance: - Performance Metrics and Measures- Parallel Processing Applications-Speedup Performance Laws-Scalability Analysis and Approaches.

UNIT II

Processors and Memory Hierarchy: - Advanced Processor Technology-Superscalar and Vector Processors- Memory Hierarchy Technology.

Bus, Cache and Shared Memory: - Bus Systems-Cache Memory Organizations-Shared-Memory Organizations.

UNIT III

Pipelining and Super Scalar Techniques: - Linear Pipeline Processors-Nonlinear Pipeline Processors-Instruction Pipeline Design-Arithmetic Pipeline Design.

Multiprocessors and Multi computers: -Multiprocessor System Interconnects-Cache Coherence and Synchronization Mechanisms-Three Generations of Multi computers – Message-Passing Mechanisms.

UNIT IV

Multivector and SIMD Computers: - Vector Processing Principles-Multivector Multiprocessors-Compound Vector Processing-SIMD Computer Organizations-The Connection Machine CM-5.

Scalable, Multithreaded, and Dataflow Architectures: - Latency –Hiding Techniques-Principles of Multithreading-Fine-Grain Multicomputers-Scalable and Multithreaded Architectures- Dataflow and Hybrid Architectures.

UNIT V

Instruction Level Parallelism:- Introduction-Basic Design Issues-Problem Definition-Model of a Typical Processor- Operand Forwarding-Reorder Buffer-Register Renaming-Tomasulo's Algorithm- Branch Prediction- Limitations in Exploiting Instruction Level Parallelism-Thread Level Parallelism.

Trends in Parallel Systems: - Brief Overview of Technology-Forms of Parallelism-Case Studies

TEXT BOOK

1. Advanced Computer Architecture- by Kai Hwang &Jotwani, 2nd Edition, McGraw-Hill Publications.

REFERENCES

1. Advanced Computer Architecture, D.Sima, T.Fountain, P.Kacsuk, Pearson Education.
2. Computer Architecture A quantitative approach 3rd edition john L.Hennessy & David A. Patterson, Morgan Kufmann(An Imprint of Elsevier).
3. Computer Architecture and parallel processing by Hwang and Briggs.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes versus Program Outcomes Mapping

COURSE OUTCOMES	PO1	PO2	PO3
CO1	3	3	
CO2	3		
CO3	3		
CO4	3	3	3
CO5	3	3	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3115)ADVANCED SOFTWARE ENGINEERING

Course Objectives:

- **Demonstrate** the basic concepts of software and various process models.
- **Define** the security parameters and software reusability
- **Recognize** the components, different aspects and testing strategies
- **Express** the software as a service and its qualities
- **Identifying** different processes and new trends

Course Outcomes:

After completion of the course the student is able to

- **Analyze** software process models and their importance.
- Get the **Knowledge** on software specifications and safety measurements.
- **Examine** the software various testing strategies and evaluation approaches.
- **Analyzing** the conceptsoftware acts as a service.
- **Understand** the upcoming software trends

UNIT I

Software and Software Engineering

The Nature of Software, Software characteristics, The Unique Nature of Web Apps, Software Engineering, The Software Process, Software Engineering Practice, Software Myths.

Software Paradigms: Perspective Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Technology, Product and Process.

Agile Development: What is Agility? Agility and the Cost of Change, What is an Agile Process? Extreme Programming (XP), Other Agile Process Models, A Tool set for the Agile Process.

UNIT II

Critical Systems: A simple safety-critical system, System dependability, Availability and reliability, Safety, Security. **Critical systems specification:** Risk-driven specification, Safety specification, Security specification Software reliability specification.

Formal Specification: Formal specification in the software process, Sub-system interface specification, Behavioral specification.

Software Reuse: The reuse landscape, Design patterns, Generator-based reuse, Application frameworks, Application system reuse.

UNIT III

Component-based Software Engineering: Components and component models, The CBSE process, Component composition.

Software Testing: System testing, Component testing, Test case design, Test automation.

Software Evolution: Program evolution dynamics, Software maintenance, Evolution Processes, Legacy system evolution.

Aspect oriented software engineering: The separation of concerns, Aspects, Join points and pointcuts, Software engineering with aspect.

UNIT IV

Service oriented software engineering: Service-based concepts, modeling and documentation, Service discovery and composition, Service-oriented architecture, Services as reusable components, Software development with services.

Quality Management

Process and product quality, Quality assurance and standards, Quality Planning, Quality control, Software Measurement and metrics.

UNIT V

Process Improvement

Process and product quality, process classification, Process measurement, Process analysis and modeling, Process change, The CMMI process improvement framework.

Emerging Trends in Software Engineering

Technology Evolution, Observing Software engineering Trends, Identifying "Soft trends", Technology directions, Tools -Related trends-Tools that respond to soft trends, Tools that address Technology Trends

TEXT BOOKS:

1. Object oriented software engineering by Timothy c. Leth Bridge, Robertlagniere-TATA McGrawhill
2. Object oriented software engineering by Ivar Jacobson
3. Software Engineering Principles By Roger S.PressMan 6th edition.
4. GradyBooch, James Rumbaugh, IvarJacobson : The Unified Modeling
5. Language User Guide, Pearson Education.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	**1**	**3**	-
CO2	-	**3**	-
CO3	-	**3**	-
CO4	-	-	3
CO5		-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3116) COMPUTER NETWORKS & ITS SECURITY

Course Objectives:

- To understand the concepts of Computer Networks.
- To illustrate Error handling mechanism in Data Link Layer.
- To focus on routing algorithms in Computer Networks.
- To choose Transport protocols in Computer Networks.
- To implement Cryptography algorithms.

Course Outcomes:

After completion of the course student is able:

- To understood the concepts of computer networks.
- To illustrate Error handling mechanism in Data Link Layer.
- To select routing algorithms in Computer Networks.
- To choose Transport protocols in Computer Networks.
- To implement Cryptography algorithms.

UNIT I

Review of Computer Networks: 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM, **Networking Devices:** Multiplexers, Modems and Internet Access Devices, Switching and Routing Devices, Router Structure. **The Link Layer and Local Area Networks:** Link Layer: Introduction and Services, Error-Detection and Error-Correction techniques, Multiple Access Protocols, Link Layer Addressing, Ethernet, Interconnections: Hubs and Switches, PPP: The Point-to-Point Protocol, Link Virtualization

UNIT II

Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intradomain Routing Protocols, Interdomain Routing Protocols, Congestion Control at Network Layer. **Logical Addressing:** IPv4 Addresses, IPv6 Addresses - **Internet Protocol:** Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6 – **Multicasting Techniques and Protocols:** Basic Definitions and Techniques, Intradomain Multicast Protocols, Interdomain Multicast Protocols, Node-Level Multicast algorithms

UNIT III

Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control **Application Layer:** Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Socket Programming with TCP and UDP, Building a Simple Web Server

UNIT IV

Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs). **Mobile A-Hoc Networks:** Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing Protocols for Ad-Hoc Networks – **Wireless Sensor Networks:** Sensor Networks and Protocol Structures, Communication Energy Model, Clustering Protocols, Routing Protocols

UNIT V

Cryptography: Concepts and Techniques:

Introduction, plain text and cipher text, substitution techniques, transposition techniques,encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.**Symmetric key Ciphers:** Block Cipher principles & Algorithms(DES, AES,Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, Key distribution Asymmetric key Ciphers: Principles of public key cryptosystems, Algorithms(RSA).

TEXT BOOKS:

1. Computer Networking: A Top-Down Approach Featuring the Internet, *James F. Kurose, Keith W.Ross*, Third Edition, Pearson Education, 2007
2. Computer and Communication Networks, *Nader F. Mir,* Pearson Education, 2007
3. Cryptography and Network Security : William Stallings, Pearson Education,5th Edition
4. Cryptography and Network Security: AtulKahate, Mc Graw Hill, 2nd Edition

REFERENCE BOOKS:

1. Data Communications and Networking, *Behrouz A. Forouzan,* Fourth Edition, Tata McGraw Hill, 2007
2. Guide to Networking Essentials, *Greg Tomsho,EdTittel, David Johnson,*Fifth Edition, Thomson.
3. An Engineering Approach to Computer Networking,*S.Keshav,* Pearson Education.
4. Campus Network Design Fundamentals, *Diane Teare, Catherine Paquet,* Pearson

5. Education (CISCO Press)
6. Computer Networks, *Andrew S. Tanenbaum*, Fourth Edition, Prentice Hall.
7. The Internet and Its Protocols,A.Farrel,Elsevier.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

	PO 1	PO 2	PO 3
CO1			3
CO2	3		2
CO3	3		3
CO4	3		3
CO5	2		3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) I Semester

(7P3118) SOFTWARE LABORATORY-1

Course Objectives:

- To make the student learn an object oriented way of solving problems.
- To make the student write ADTs for all data structures.
- To make the student learn different algorithm design techniques.
- To make use of various tools

COURSE OUTCOMES:

Upon successful completion of this Lab the student will be:

- Able to apply object oriented concepts and Abstract Data Types for data structures with templates in C++ language
- Able to write programs on the different trees and their operations
- Able to the implementation of Pattern Matching AlgorithmTo organize different datasets with preprocessing techniques and perform association rule mining.
- To find the accuracy of different classifier models and classify different applicants.
- To analyze the cross validation technique and construct a decision tree, the concept of tree pruning, clustering on different datasets.

Week1: Write C++ programs using object oriented concepts.
Week2: Write a C++ program to implement all the functions of a dictionary ADT using hashing.
Week3: Write a C++ program to perform the following operations on Binary Trees.
a) Insertion b) Deletion c) Searching
Week5: Write C++ programs to perform the traversals for the given binary tree.
a) Preorder b) inorder c) postorder
Week5: Write C++ programs forpriority queue implementation using Heaps.
a) Min Heap Insertion b) Min Heap Deletion
c) Max Heap Insertion d) Max Heap Deletion
Week6: Write a C++ program to perform the following operations on Binary Search Trees.
a) Insertion b) Deletion c) Searching
Week7: Write a C++ program to perform the following operations on B-Trees.
a) Insertion b) Deletion c) Searching
Week8: Write a C++ program to perform the following operations on AVL Trees.
a) Insertion b) Deletion c) Searching
Week9: Write a C++ Program to implement Boyer-Moore pattern matching algorithm.
Week10: Write a C++ Program to implement Knuth-Morris-Pratt pattern matching algorithm.
Week11:
Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer

decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. Credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer!)

A few notes on the German dataset

- DM stands for Deutsche Mark, the Unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- Foreign worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Sub tasks: (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment ? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?
5. Is testing on the training set as you did above a good idea? Why orWhy not?
6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what cross-validation is briefly. Train a Decision Tree

again using cross-validation and report your results. Does your accuracy increase/decrease? Why?

7. Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the ARFF data file to get all the attributes initially before you start selecting the ones you want.)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifcations equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

Week12:

1. Demonstration of preprocessing on dataset student.arff
2. Demonstration of preprocessing on dataset labor.arff
3. Demonstration of Association Rule process on dataset contactlenses.arff using Apriori algorithm
4. Demonstration of Association Rule process on dataset test.arff using Apriori algorithm
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means algorithm
10. Demonstration of clustering rule process on dataset student.arff using simple k-means algorithm

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
  - Weka resources: Introduction to Weka (html version) (download ppt version)
  - Download Weka
  - Weka Tutorial
  - ARFF format
- Using Weka from command line

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Lab Examination (SEE) 60 Marks
Internal1 30 Marks	Internal2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	**3**	**-**	3
CO2	**3**	**3**	3
CO3	**3**	**-**	3
CO4	**3**	**3**	3
CO5	**3**	**-**	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) II Semester

(7P3121) BIG DATA & DATA ANALYTICS

Course Objectives:

- To understand fundamental concepts of Big Data and solve its challenges using hadoop compared with RDBMS.
- To understand NoSQL and analyze the data compared with SQL.
- To learn R Working environment, the languages Spark and Scala.

Course outcomes:

On successful completion of this course the students will be:

- Able to understand the need of big data in present world and its challenges.
- Able to analyze the data using hadoop and is compared with RDBMS.
- To analyze data using NoSQL.
- To understand R language and analyze different types of data.
- Able to write the programs to solve data analytics problems using the languages Spark and Scala.

UNIT I

Types of Digital data: Classification of Digital Data, Introduction to Big Data: What is big data, Evolution of Big Data, Traditional Business Intelligence vs Big Data, Coexistence of Big Data and Data Warehouse. Big Data Analytics: What is Big Data Analytics, What Big Data Analytics Isn't, Why this sudden Hype Around Big Data Analytics, Classification of Analytics, Greatest Challenges that Prevent Business from Capitalizing Big Data, Top Challenges Facing Big Data, Why Big Data Analytics Important, Data Science, Terminologies used in Big Data Environments.

UNIT II

Hadoop: Features of Hadoop, Key advantages of hadoop, versions of hadoop, overview of hadoop ecosystem, Hadoop distributions. Why hadoop? RDBMS vs Hadoop, Distribution computing challenges, History of hadoop, Hadoop overview,HDFS

UNIT III

Processing data with hadoop, interfacing with hadoop ecosystem. NoSQL: Where it is used? What is it? Types of NoSQL Databases, Why NoSQL? Advantages of NoSQL, What we miss with NoSQL? Use of NoSQL in industry,SQL vs NoSQL.

UNIT IV

What is R? Why use R for analytics? How to run R? First R example, functions a short programming example, some important R data structures, vectors, matrices, lists, R programming structures.

UNIT V

Introduction to Spark, Scala language: values, data types, variables, expressions, conditional expressions, evaluation order, compound expressions, functions, tuple with functions, List, Length, ++, ::, sorted, reverse, sum. slice, mkString, contains, map, filter, leftfold, reduce, Map, Contains, getOrElse, WithDefault, Keys and Values, groupBy, set, mapValues, keys and values, Option(Some and None), Objects, classes, inheritance, traits

TEXT BOOKS:

1. BIG DATA and ANALYTICS, Seema Acharya, SubhashiniChellappan, Wiley publications.(Unit I, II, III)
2. BIG DATA, Black BookTM ,DreamTech Press, 2015 Edition.
3. "The art of R programming" by Norman matloff, 2009.(Unit IV)
4. "Atomic Scala", 2nd edition, Bruce Eckel, Dianne Marsh. (Unit V)

REFERENCE BOOKS:

1. Rajiv Sabherwal, Irma Becerra- Fernandez," Business Intelligence –Practice, Technologies and Management", John Wiley 2011.
2. Lariss T. Moss,ShakuAtre, " Business Intelligence Roadmap", Addison-Wesley It Service.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	**3**	**-**	3
CO2	**3**	**3**	3
CO3	**3**	**-**	3
CO4	**3**	**3**	3
CO5	**3**	**-**	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) IISemester

(7P3122) ADVANCES IN SOFTWARE TESTING

Course objectives:
- Study the significance of testing
- Study the testing to be done at various levels
- Understand the procedure for designing test cases

Course Outcomes:
- Ability to systematically test the applications
- Ability to write the test cases
- Ability to use testing tools effectively

UNIT I

Control flow graph – basic blocks, flow graphs, paths, basic paths, path conditions and domains, Dominators and post-dominators; Program dependence graph – data dependence, control dependence, call graph,

Tests generation - Test selection Problem, equivalence partitioning, Equivalence class partitioning, boundary value analysis and category partitioning method.

UNIT II

Finite state machines (FSM) - properties of FSM, Conformance testing, test generation, test optimization, Fault detection. **Combinatorial designs** – combinatorial test design process. **Pairwise design**: Binary factors and multi-valued factors. **Orthogonal arrays** and multi level orthogonal arrays.

UNIT III

Test Adequacy: Basics, measurement of test adequacy, infeasibility and test adequacy. Adequacy criteria based control – statement, block, conditions and decisions coverage techniques. Basics of Junit tool for Java.

Metrics

Importance of Metrics in Testing - Effectiveness of Testing – Defect Density – Defect Leakage Ratio – Residual Defect Density – Test Team Efficiency – Test Case Efficiency.

UNIT IV

Regression Testing

What is Regression Testing? Regression test process. Regression test selection techniques: Test all, Random selection, modification traversing tests, using execution trace. Test minimization and prioritization.

UNIT V

Non-functional testing

Load testing, performance testing, GUI testing, Security testing techniques and tools.

Automation: Case studies functional test automation using Selenium

Text Books:

1. Aditya P Mathur, Foundations of software testing, 2nd edition, Pearson , 2013.
2. Boris Beizer, “Software Testing Techniques”, 2nd Edition, Dream tech press, 2003.

Reference Books:

1. M G Limaye, “Software Testing – Principles, Techniques and Tools”, Tata McGraw Hill, 2009.
2. Edward Kit, “Software Testing in the Real World - Improving the Process”, Pearson Education, 2004.
3. William E. Perry, “Effective methods for software testing”, 2nd Edition, John Wiley, 2000.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	**3**	**3**	**3**
CO2	**3**	**3**	**3**
CO3	**3**	**3**	**-**
CO4	**3**	**3**	**-**
CO5	**3**	**3**	**3**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) II Semester

(7P3123) SOFTWARE ARCHITECTURE AND DESIGN PATTRENS

Course Objectives:

1. **Understand** the basic idea of Design patterns.
2. **Learn** the preexisting creational and Collection patterns.
3. **Gain** knowledge on preexisting Structural patterns.
4. **Know** the features of various Behavioral patterns.
5. **Demonstrate** the need of concurrency patterns.

Course Outcomes:

1. **Gain** knowledge to solve problems that are occurring again and again in real world.
2. **classify** different creational and collection patterns.
3. **Interprets** various Structural Patterns for applying in real world.
4. **Demonstrate** behavior of each pattern applied as a solution to the existing problem.
5. **Use** locking mechanism solution to come out of critical section problem.

UNIT I

Introduction: Architectural to Software Design Patterns, What Is a Design Pattern? More about Design Patterns, design patterns to solve design problems, selecting a design pattern, Use of a design pattern

BASIC PATTERNS: Interface, Abstract Parent Class, Private Methods, Accessor Methods, Constant Data Manager, Immutable Object, Monitor

UNIT II

CREATIONAL PATTERNS: Factory Method, Singleton, Abstract Factory, Prototype, Builder.

COLLECTIONAL PATTERNS: Composite, Iterator, Flyweight, Visitor

UNIT III

STRUCTURAL PATTERNS: Decorator, Adapter, Chain of Responsibility, Facade, Proxy, Bridge, Virtual Proxy, Counting Proxy, Aggregate Enforcer, Explicit Object Release, Object Cache

UNIT IV

BEHAVIORAL PATTERNS-1: Command, Mediator, Memento, Observer, Interpreter, State, Strategy, Null Object.

BEHAVIORAL PATTERNS-2: Template Method, Object Authenticator, Common Attribute Registry

UNIT V

CONCURRENCY PATTERNS: Critical Section, Consistent Lock Order, Guarded Suspension, Read-Write Lock

Text Books:

1. Software Architecture Design Patterns in Java, ParthaKuchana
2. Design Patterns: Elements of Reusable Object-Oriented Software, Erich Gamma, Richard Helm et al, PEA

REFERENCE BOOKS:

1. Beyond Software architecture, Luke Hohmann, Addison wesley, 2003.
2. Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR,2001

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

	PO1	PO2	PO3
CO1	1	3	3
CO2	-	3	3
CO3	-	3	3
CO4	-	-	3
CO5	-	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) II Semester

(7P3124) DISTRIBUTED OPERATING SYSTEMS

Course Objectives:

- To understand the basic concepts of distributed operating systems.
- To analyze concepts like process Synchronization, Distributed file systems, Shared Memory, Consistency models.

Course Outcomes:

At the end of the course students should be able to:

- Recognize the basic concept of distributed operating system.
- Identify the importance of process synchronization distributed system
- Outline various concepts in distributed file systems
- Analyze shared memory concepts for various systems or different types
- Assess consistency models along with a case study of mach.

UNIT I

Introduction to Distributed Systems: Distributed systems: Goals Hardware Concepts Software – design

Communication distributed systems: Layered Protocol: ATM Networks, Client Server Model - Remote Procedure Call – Group Communication.

UNIT II

Synchronization: Clock synchronization - mutual exclusion - dead locks.

Process and Processors: Threads - System models processor allocation - scheduling fault tolerance - real time distributed systems.

UNIT III

Distributed file systems: File system design and implementation - trends in distributed file systems.

UNIT IV

Shared Memory: Introduction - bus based multi processors ring based multiprocessors switched multiprocessors - NUMA comparison of shared memory systems.

UNIT V

Consistency models - page based distributed shared memory - shared variable- distributed shared memory - object based distributed shared memory.

Case study: Mach

Text Book:

1. Andrew S.Tanenbaum: Distributed Operating System, Prentice Hall International Inc.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes versus Program Outcomes Mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**
CO1	-	-	-
CO2	-	-	3
CO3	-	-	3
CO4	-	-	3
CO5	-	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) II Semester

(7P3125) MACHINE LEARNING
(ELECTIVE-I)

Course Objectives:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.
- To be able to read current research papers and understands the issues raised by current research.

Course Outcomes:

After completion of the syllabus the student will be:

- Able to understand the basic knowledge about the key algorithms and theory that form the foundation of machine learning and computational intelligence
- Able to understand different machine learning algorithms and methods for classification.
- Students will understand the principles, advantages, limitations such as over fitting and possible applications of predictive analysis.
- Able to identify and apply the appropriate machine learning technique to various decision making problems.
- Able to understand different types of learning approaches.

Unit– I

INTRODUCTION: Well-posed learning problems, Designing a learning system, Perspectives and issues in machine learning Concept learning and the general to specific ordering – Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias

Unit– II

Decision Tree learning – Introduction, Decision tree representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space

search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning Artificial Neural Networks – Introduction, Neural network representation, Appropriate problems for neural network learning, Perceptions, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition Advanced topics in artificial neural networks Evaluation Hypotheses – Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms

Unit– III

Bayesian learning – Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, An example learning to classify text, Bayesian belief networks The EM algorithm Computational learning theory – Introduction, Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis Space, Sample Complexity for infinite Hypothesis Spaces, The mistake bound model of learning - Instance-Based Learning- Introduction, k -Nearest Neighbour Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning Genetic Algorithms – Motivation, Genetic Algorithms, An illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

Unit– IV

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

Unit– V

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to Alter the Search Objective, Using Prior Knowledge to Augment Search Operators, Reinforcement Learning – Introduction, The Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

Text Books:

1. Machine Learning – Tom M. Mitchell, - MGH
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC)

Reference Books:

1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge Univ Press.
2. Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc., 2001 3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO 1	PO 2	PO 3
CO1			3
CO2	**2**		3
CO3		**3**	3
CO4	**2**	**3**	
CO5		**3**	

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) II Semester

(7P3126)GRID AND CLUSTER COMPUTING

(ELECTIVE-1)

Course Objectives:

1. **Understands** the fundamental concepts of computational grids through examples.
2. **Describe** how to setup a cluster and manage.
3. **Knows** various scheduling fault tolerance techniques with the help of example cluster systems.
4. **Identify** prerequisites needed for pervasive computing.
5. **Demonstrate** the basic fundamentals of cloud & quantum computing**.**

Course Outcomes:

- **Understand** where the grid computing could be effectively utilized by illustrations of applications of grid computing
- **learn** the technology and tool kits for facilitating cluster computing.
- **knowledge** of Cluster Computing, process scheduling and load balancing.
- **Introduce** the broad perceptive of pervasive computing.
- **Explore** some important cloud computing driven commercial systems such as Web Services and other businesses quantum applications.

UNIT I

Grid Computing: Data & Computational Grids, Grid Architectures and its relations to various Distributed Technologies

Autonomic Computing: Autonomic Computing, Examples of the Grid Computing Efforts (IBM)

UNIT II

Cluster Computing 1: Cluster setup & its Administration, Performance Models & Simulations, Networking, Protocols & I/O, Lightweight Messaging systems, Active Messages, Distributed shared memory, parallel I/O Clusters, Jib and Resource management system, scheduling parallel jobs on clusters

UNIT III

Cluster Computing 3: Load sharing and Fault tolerance manager, parallel programming scheduling techniques, Dynamic load balancing Example Cluster System, Beowlf, COMPaS and NanOS

UNIT IV

Pervasive Computing: Pervasive Computing concepts & Scenarios, Hardware & Software, Human - machine interface Device connectivity, Java for Pervasive devices, Application examples

UNIT V

Cloud Computing: History, Working of cloud computers, pros and cons of cloud computing, developing cloud services, cloud computer web based applications

Quantum Computing: Introduction to Quantum Computing, QUbits, Quantum Mechanics, Quantum gates, Applications of quantum computing.

TEXT BOOKS:

1. Grid Computing, J. Joseph & C. Fellenstein, PEA.
2. High performance cluster computing, Raj Kumar Buyya, PEA.
3. Pervasive computing, J.Burkhardtet .al, PEA.
4. Quantum computing, Vishal Sahni, TMH.

REFERENCE BOOKS:

1. Approaching quantum computing, Marivesar, PEA.
2. Quantum computing and Quantum Information, Neilsen& Chung L, Cambridge University Press.
3. A Networking approach to Grid Computing ,Minoli, Wiley.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

	PO1	**PO2**	**PO3**
CO1	1	3	3
CO2	-	3	3
CO3	-	3	3
CO4	-	-	3
CO5	-	3	-

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

(AN AUTONOMOUS INSTITUTION)

M.Tech (CSE) II Semester

(7P3127)CLOUD COMPUTING

(ELECTIVE-1)

Course Objectives:

- To learn the basic concepts of Virtualization.
- To gain knowledge in server and storage virtualization.
- To summarize the concept of virtualization that is fundamental to cloud computing.
- To Understand the various models of Cloud computing.
- To understand the security issues in the grid and the cloud environment.

Course Outcomes:

At the end of the course students should be able to:

- Apply the concept of virtualization in the cloud computing.
- Employ the concepts of storage virtualization and its management.
- Develop services using Cloud computing.
- Identify the architecture, infrastructure and delivery models of cloud computing.
- Apply the security models in the cloud environment.

UNIT I

Introduction to Virtualization: Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as a service – SaaS, grid computing, utility computing, virtualization processes.

Virtualization Technologies-I:ubuntu (server edition),altiris, windows, server, software virtualization, vmware, intel virtualization, red hat virtualization, softgrid application, Linux virtualization.

UNIT II

Virtualization Technologies-II: Desktop, virtualization, hardware virtualization, resource virtualization, processor virtualization, application virtualization Storage virtualization, virtualization density, para-virtualization, OS virtualization, virtualization software, data storage virtualization, Intel virtualization technology, thinstall virtualization suite, net framework virtualization, windows virtualization on fedora, storage virtualization technologies, virtualization level, security monitoring and virtualization, oracle virtualization.

UNIT III

Virtualization and Storage Management: The heart of cloud computing -virtualization, defining virtualization, why virtualize, what can be virtualized, where does virtualization happen, how does virtualization happen, on the road to storage virtualization, improving availability using virtualization, improving performance through virtualization, improving capacity through virtualization, business value for virtualization.

UNIT IV

Introduction to Cloud Computing: Cloud Introduction and overview- Components, Infrastructure and Services, Why Use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology- Hardware & Software InfrastructureCloud Computing Architecture: Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, and Distributed Computing.

UNIT V

Security: Security issues in Cloud Computing - Data Security, Network Security, and Host Security.

Disaster Recovery: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management. Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale.

Case Studies: Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE

TEXT BOOKS:

1. Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book, Ivanka Menken, Gerard Blokdijk, 2009.
2. B002BLL870 Cloud Application Architectures Building Applications and Infrastructure in the Cloud, George Reese, O'Reilly Media Press, 2009.

REFERENCE BOOKS:

1. Cloud Computing: A Practical Aprroach, Anthony T.Velte, TobeJ.Velte, Robert Elsenpeter, Publication Person Education, 2009
2. Storage Virtualization: Technologies for Simplifying Data Storage and Management,TomClark,Addison-Wesley, 2005
3. Cloud Computing Technologies and Strategies of the Ubiquitous Data Center,Curtis Franklin Jr.Brian J.S. Chee**,**2010
4. Introduction to Cloud Computing: Business & Technology, Timothy Chou,2009

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

	PO1	**PO2**	**PO3**
Co-1	**3**	**-**	**-**
Co-2	**3**	**-**	**-**
Co-3	**2**	**-**	**3**
Co-4	**2**	**3**	**-**
Co-5	**3**	**-**	**-**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

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M.Tech (CSE) II Semester

(7P3128)INTERNET OF THINGS
(ELECTIVE – II)

Course Objectives:

- To Understand, the Enabling technologies of IoT.
- To Analyze various layers of Enterprise IoT Stack.
- To interpret various Applications of IoT.
- To understand and memorize various Internet Protocols.
- To Design Applications for real time scenario using the concepts of Arduino Platform and Embedding Computing Basics.

Course Outcomes:

After completion of the course student will be able to

- Understand and learn, the identifier and basics of RFID
- Analyze the functionalities of IoT stack layers and the concepts of IoT Security and Management.
- Interpret various applications Manufacturing, Predictive Based Maintenance Optimization, Connected Car.
- Understand and memorize basic concepts of 6LoWPAN, Architecture, MQTT-S, ZigBee.
- Design various Applications using Microcontrollers, Arduino, System On Chips

Unit I

The Internet of Things:An Overview

Introduction to Internet of Things,History of IoT, The identifier in the IoT, Enabling technologies of IoT,Radio Frequency Identification Technology (RFID).

Unit II

Enterprise IoT Stack

IoT stack, Device Layer, Communication Layer,Core Platform Layer, Analytics Platform Layer,Cognitive Platform Layer,Solutions Layer,IoT Security & Management

Unit III

Application of IoT

Manufacturing, Monitoring & Utilization, Asset Management, Instrumentation, Handle Connectivity, Perform Monitoring, Condition Based Maintenance, Predictive Based Maintenance, Optimization, Connecting Connected Solutions, Connected Car.

Unit IV

Internet Protocol

The Wireless Embedded Internet: Introduction to 6LoWPAN**,**The 6LoWPAN Architecture ,The Basic 6LoWPAN Format,Addressing ,MQ telemetry transport for sensor networks (MQTT-S),ZigBee compact application protocol,Contiki and uIPv6, Wireless RFID Infrastructure.

Unit V

Embedded Devices

Embedded Computing Basics-Microcontrollers, System-on-Chips, Choosing your Platform, **Arduino-**Developing on the Arduino, Some Notes on the Hardware, Openness.

Text Books:

1. The Internetof ThingsConnecting Objects to the Web,HakimaChaouchi,Wiley publications,2010.(Unit I)
2. Designing the Internet of Things,Adrian McEwen, Hakim Cassimally, Wiley 2014.
3. Enterprise IoT, A Definitive Handbook by Naveen Balani.
4. 6LoWPAN: The WirelessEmbedded Internet, Zach Shelby and Carsten Bormann,Wiley publications, first edition,2009.(Unit IV)

Reference Books:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013
3. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	**3**	**3**	3
CO2	**3**	-	3
CO3	**3**	-	3
CO4	**3**	-	3

CO5	**3**	**3**	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

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M.Tech (CSE) II Semester

(7P3129) ANDROID APPLICATION DEVELOPMENT

(ELECTIVE-II)

Course Objectives:

- To **understand** the fundamentals of smart phone programming and android software development tools.
- To **construct and apply** knowledge on how to develop User Interface for a mobile application
- **Design, develop and substitute** basic things on data persistence, content provider, messaging, and location based services for a mobile application.

Course Outcomes:

Upon completion of the subject, students will be:

- Able to **recognize** the importance of knowledge on Android programming basics and its tools.
- Able to **construct** the various aspects of user interfaces.
- Able to **apply** knowledge on displaying pictures, menus and persistent data services.
- Able to **develop** application on content provider and messaging services.
- Able to **substitute** on the fundamentals of location based services, and creating your own services.

Unit–I:

Getting started with android programming: What is android, obtaining the required tools, creating first android application using android studio, anatomy of android application

Activities, fragments & Intents: Understanding activities, linking activities using intents, fragments, calling built-in applications using intents, displaying notifications.

Unit–II

Getting to know the android user interface: Understanding the components of a screen, adapting to display orientation, managing changes to screen orientation, utilizing the action bar, creating the user interface programmatically, and listening for UI notifications.

Designing User Interface with Views: Using basic views, using picker views, using list views to display long lists.

Unit–III

Displaying pictures and Menus with Views: Using image views to display pictures-Gallery and Image View views, using menus with views, analog and digital clock views.

Data Persistence: Saving and loading user preferences, persisting data to files, creating and using databases.

Unit–IV

Content Providers: Sharing data in android, using a content provider, creating own content providers.

Messaging: SMS messaging, sending E-mail.

Unit–V

Location based services: Displaying maps, getting a location data, monitoring a location, building a location tracker.

Developing android services: Creating your own services.

Text Book:

Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013

Reference Books:

1. Beginning Android Programming with Android Studio 4th Edition by J. F. Dimarzio
2. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012
3. Android Application Development for Java Programmers, James C Sheusi, Cengage Learning, 2013

Mode of evaluation:

<table>
<tr><td colspan="2">Continuous Internal Examination (CIE)</td><td>Continuous Evaluation</td><td rowspan="2">Semester End Examination (SEE)
60 Marks</td></tr>
<tr><td>Mid1
30 Marks</td><td>Mid2
30 Marks</td><td>10 Marks</td></tr>
</table>

Course Outcomes versus Program Outcomes Mapping

COURSE OUTCOMES	PO1	PO2	PO3
CO1		-	-
CO2		-	3
CO3		-	3
CO4		-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

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M.Tech (CSE) II Semester

(7P312A) NETWORK MANAGEMENT SYSTEMS

(ELECTIVE – II)

Course Objectives:

1. To understand the basics Communications protocols and Standards in Network Management Systems.
2. To know about the functioning of the SNMP Management and its models in the network.
3. To learn about the SNMPv2 Protocol and RMON in Network Management Systems.
4. To acquire the knowledge on Telecommunications Management Network Conceptual Model and its Architecture.
5. To perceive the concepts of Web-Based Management in Network Management Systems.

Course Outcomes:

Upon the completion of the subject, students will be able to:

1. Recognize the importance of the Communications protocols and issues in the Network Management Systems.
2. Understandthe SNMP concept in the Communication Model and Functional model.
3. Connect and control the system remotely with the help of Network Protocols.
4. Understand the Telecommunications Management and its operations in the Network Management Systems.
5. Create a web interface to the SNMP Management Protocol.

UNIT I

DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW: Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

UNIT II

SNMPV1 NETWORK MANAGEMENT: Organization and Information and Information Models. Communication and Functional Models.

Managed network -The History of SNMP Management, The SNMP Model, The Organization Model, The Information Model.Communication and Functional Models. The SNMP Communication Model, Functional model.

UNIT III

SNMP MANAGEMENT: SNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Protocol,

RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring,

UNIT IV

TELECOMMUNICATIONS MANAGEMENT NETWORK: Why TMN?, Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

UNIT V

WEB-BASED MANAGEMENT: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation.

TEXT BOOK:

1. Mani Subrahmanian, *Network Management- Principles and Practice*. Pearson Education.

REFERENCE BOOKS:

1. Morris,*Network management*. Pearson Education.
2. Mark Burges, *Principles of Network System Administration*. Wiley Dreamtech.
3. Paul, *Distributed Network Management*. John Wiley.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Examination (SEE) 60 Marks
Mid1 30 Marks	Mid2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	3	-	3
CO2	-	-	-
CO3	3	-	3
CO4	3	-	-
CO5	3	-	3

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, RAJAMPET

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M.Tech (CSE) II Semester

(7P312C**) SOFTWARE LABORATORY-2**

Course Objectives:

- Test the software applications using standard tools available in the market

COURSE OUTCOMES:

On successful completion of this course the students will be*:*

- To learn to use the following (or Similar) automated testing tools to automate testing: Win Runner/QTP for functional testing.
- To use Load Runner for Load/Stress testing.
- To Test Director for test management.
- Apply JUnit, HTMLUnit, CPPUnit.
- To study state-of-art tools for software testing and Middleware technologies

1. Write programs in C Language to demonstrate the working of the following constructs: i) do...while ii) while….do iii) if…else iv) switch v) for

2. A program written in C language for Matrix Multiplication fails. Introspect the causes for its failure and write down the possible reasons for its failure.

3. Consider ATM System and Study its system specifications and report the various bugs.

4. Write the test cases for Banking application.

5. Create test plan document for Library Management System.

Create test cases for Railway Reservation.

7. Create test plan document for Online Shopping.

Working with Tool's:

Understand the Automation Testing Approach, Benefits, Workflow, Commands and Perform Testing on one application using the following Tool's.

1. Win runner Tool for Testing.

2. Load runner Tool for Performance Testing.

3. Selenium Tool for Web Testing.

4. Bugzilla Tool for Bug Tracking.

5. Test Director Tool for Test Management.

6. Test Link Tool for Open Source Testing.

References:

1. M G Limaye, "Software Testing – Principles, Techniques and Tools", Tata McGraw Hill, 2009.

2. Edward Kit, "Software Testing in the Real World - Improving the Process", Pearson Education, 2004.

3. William E. Perry, "Effective methods for software testing", 2nd Edition, John Wiley, 2000.

Mode of evaluation:

Continuous Internal Examination (CIE)		Continuous Evaluation	Semester End Lab Examination (SEE) 60 Marks
Internal1 30 Marks	Internal2 30 Marks	10 Marks	

Course Outcomes & Program Outcomes Mapping:

Course Outcomes	PO1	PO2	PO3
CO1	3	-	3
CO2	-	-	-
CO3	3	-	3
CO4	3	-	-
CO5	3	-	3