TENTETIVE LESSON PLAN – M5801
COMPUTER SCIENCE AND ENGINEERING

Course Title: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE		
Section : M.TECH - CSE	Date : 22-02-2021	Page No : 01 of 03
Revision No : 00	Prepared By : T.Prasanna	Approved By : HOD

Tools : Black board

No. of Periods	TOPIC	Date	Mode of Delivery
	UNIT- I:BASIC PROBABILITY AND RANDOM VARIABLES **CO1: To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of discrete and Continuous Probability theory. To introduce students to the basic methodology of "probabilistic thinking" and to apply it to problems.** **TB1 :: PROBABILITY AND STATISTICS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.**		
1.	Introduction to Random Experiments, Sample Spaces Events, the Concept of Probability the Axioms of Probability	From: 22/02/2021 To: 13/03/2021	Lecture interspersed with discussions
2.	Some Important Theorems on Probability Assignment of Probabilities		
3.	Conditional Probability Theorems on Conditional Probability, Independent Events		
4.	Bayes Theorem or Rule, Problems		
5.	Problems		
6.	Random Variables, Discrete Probability Distributions, Distribution Functions for Random Variables		
7.	Distribution Functions for Discrete Random Variables: Binomial Distribution-p.m.f, Properties, Problems		
8.	Problems		
9.	Poisson Distribution-p.m.f, Properties, Problems		
10.	Problems		
11.	Geometric Distribution-p.d.f, Properties,Problems		
12.	Problems		
13.	Tutorial Class		
14.	Distribution Functions for Continuous Random Variables: Uniform Distribution- p.d.f., properties, problems		
15.	Exponential Distribution- p.d.f., properties, problems		
16.	Problems		
17.	Normal Distribution- p.d.f., properties, problems		
18.	Normal Approximation to Binomial distribution		
19.	Problems		
20.	Gamma Distribution, Problems		
21.	Weibull Distribution, Problems		

UNIT- II : SAMPLING AND ESTIMATION THEORY

CO2: The aim of this course is to cover sampling design and analysis methods that would be useful for research and management in many field. A well designed sampling procedure ensures that we can summarize and analyze data with a minimum of assumptions and complications.

TB1 : PROBABILITY AND STATISTICS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

22.	Population and Sample, Random Numbers Population Parameters Sample Statistics Sampling Distributions	From: 15/03/2021 To: 27/03/2021	Lecture interspersed with discussions
23.	Statistical Inference Sampling With Replacement Problems		
24.	Sampling Without Replacement Problems		
25.	Frequency Distributions, Relative Frequency Distributions		
26.	Mean, Median and Mode of the Frequency Distribution		
27.	Computation of Mean, Variance, and Moments for Grouped Data		
28.	Central Limit theorem		
29.	Tutorial Class		
30.	Sampling Distribution of Mean with Unknown Variance, Problems		
31.	Sampling Distribution of Proportions, Problems		
32.	t - distribution		
33.	F- distribution		
34.	Chi- Square Distribution		
35.	Point Estimation, Maximum Error Estimate - Problems		
36.	Interval Estimation - Problems		
37.	Maximum Likelihood Estimates		

UNIT III: TESTS OF HYPOTHESIS AND SIGNIFICANCE

CO3 : One of the most important uses of statistics is to be able to make conclusions and test Hypothesis. Your conclusions can never be absolutely sure but you can quantify of your measure of confidence in the results.

TB1 : PROBABILITY AND STATISTICS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

38.	Statistical Decisions Statistical Hypotheses. Null Hypotheses Tests of Hypotheses and Significance Type I and Type II Errors Level of Significance	From: 28/03/2021 To: 24/04/2021	Lecture interspersed with discussions
39.	Large Samples: Test for Single Mean, Problems		
40.	Test for Two Means, Problems		
41.	Test for Single Proportion, Problems		
42.	Test for Two Proportion, Problems		
43.	Tutorial Class		
44.	Small Samples: Studcent t - distribution for		

45.	Studcent t - distribution for two Means,		
46.	Paired t - test, Problems		
47.	F- distribution, Problems		
48.	Chi- Square distribution for Goodness of fit,		
49.	Chi- Square distribution for Contingency Tables		
50.	Power of a Test Quality Control Charts Fitting		

UNIT – IV : ALGEBRAIC STRUCTURES AND NUMBER THEORY

CO4 : Overview of algebraic structures, Group theory, number theory, basic algorithms in number Theory.

TB1 : DISCRETE MATHEMATICS AND ITS APPLICATIONS WITH COMBINATORICS AND GRAPH THEORY, 7th Edition, H.Rosen, Tata McGraw Hill, 2003

51.	Algebraic systems, Examples, General properties	From: 26-04-2021 To: 12-05-2021	Lecture interspersed with discussions
52.	Semi groups and Monoids		
53.	Homomorphism of semi groups and monoids		
54.	Group, Subgroup, Abelian Group, Homomorphism, Isomorphism		
55.	Tutorial class		
56.	Properties of integers, division theorem		
57.	GCD, Euclidean algorithm		
58.	LCM, Testing for prime numbers		
59.	The fundamental theorem of Arithmetic		
60.	Modular Arithmetic, Euler and Fermat's theorems		
61.	Tutorial class		

UNIT –V : GRAPH THEORY

CO5: Student will be able to manipulate and analyze data graphically using Appropriate software.

TB1 : DISCRETE MATHEMATICS AND ITS APPLICATIONS WITH COMBINATORICS AND GRAPH THEORY, 7th Edition, H.Rosen, Tata McGraw Hill, 2003

62	Basic concepts of graphs, sub graphs	From: 13-05-2021 To: 22- 05-2021	Lecture interspersed with discussions
63	Representation of graphs: Adjacency, Incidence matrices		
64	Isomorphic graphs		
65	Paths, circuits, Eulerian and Hamiltonian graphs		
66	Multi graphs, Problems		
67	Tutorial class		
68	Planar graphs, Euler's formula		
69	Graph Colouring and covering		
70	Chromatic numbers		
71	Spanning trees, Algorithms for spanning trees		

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Department of Computer Science and Engineering

TENTATIVE LESSON PLAN: M5802
ADVANCED DATA STRUCTURES & ALGORITHMS

Course Title: Advanced Data Structures & Algorithms (M5802)		
Section : M Tech	Date : 20/02/2021	Page No : 01 of 03
Revision No : 00	Prepared By : M Naresh Babu	Approved By : HOD

Tools: Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
Unit-1 Introduction To Data Structures & STACKS and QUEUES **CO1: Single Linked, Double Linked Lists, Stacks, Queues, Searching and Sorting techniques, Trees, Binary trees, representation, traversal, Graphs- storage, traversal.** **TB:" Data Structures, Algorithms and Applications in java, 2/e, Sartaj Sahni,University Press "**			
1	Introduction to Data Structures	22/02/21	Lecture interspersed with discussions
2	Singly Linked Lists	23/02/21	
3	Doubly Linked Lists	24/02/21	
4	Circular Lists Algorithms	25/02/21	
5	Stacks and Queues	26/02/21	
6	Algorithm Implementation using Linked Lists	27/02/21	
7	Tutorial	01/03/21	
UNIT-II: SEARCHING AND SORTING ,TREES and GRAPHS **CO2: Dictionaries, ADT for List, Stack, Queue, Hash table representation, Hash functions, Priority queues, Priority queues using heaps, Search trees.** **TB:" Data Structures, Algorithms and Applications in java, 2/e, Sartaj Sahni,University Press "**			
8	Searching-Linear and Binary	02/03/21	Lecture interspersed with discussions
9	Search Methods	03/03/21	
10	Sorting-Bubble Sort	04/03/21	
11	Selection Sort	05/03/21	
12	Insertion Sort	08/03/21	
13	Quick Sort	10/03/21	
14	Merge Sort	11/03///21	
15	Trees- Binary trees	12/03/21	
16	Properties	15/03/21	
17	Representation and Traversals (DFT, BFT)	17/03/21	
18	Expression Trees (Infix, prefix, postfix)	19/03/21	
19	Graphs-Basic Concepts	20/03/21	
20	Storage structures and Traversals	22/03/21	
21	Tutorial	23/03/21	

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-III: DICTIONARIES & OPEN ADDRESSING			
CO2: Dictionaries, ADT for List, Stack, Queue, Hash table representation, Hash functions, Priority queues, Priority queues using heaps, Search trees.			
TB:" Data Structures, Algorithms and Applications in java, 2/e, Sartaj Sahni,University Press "			
22	Dictionaries	25/03/21	Lecture interspersed with discussions
23	ADT	26/03/21	
24	The List ADT	29/03/21	
25	Stack ADT	30/03/21	
26	Queue ADT	1/04/21	
27	Hash Table Representation	3/04/21	
28	Hash Functions	13/04/21	
29	Collision Resolution-Separate Chaining	14/04/21	
30	Open Addressing-Linear Probing	15/04/21	
31	Double Hashing	16/04/21	
32	Tutorial	17/04/21	
UNIT-IV: PRIORITY QUEUES			
CO1: Single Linked, Double Linked Lists, Stacks, Queues, Searching and Sorting techniques, Trees, Binary trees, representation, traversal, Graphs- storage, traversal.			
TB:" Data Structures, Algorithms and Applications in java, 2/e, Sartaj Sahni,University Press "			
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
33	Priority queues- Definition	19/04/321	Lecture interspersed with discussions
34	ADT	20/04/21	
35	Realizing a Priority Queue Using Heaps	23/04/21	
36	Definition	24/04/21	
37	Insertion	26/04/21	
38	Deletion	28/04/21	
39	Search Trees- Binary Search Trees	29/04/21	
40	Definition	30/04/21	
41	ADT	1/05/21	
42	Implementation	3/05/21	
43	Operations Searching	4/05/21	
44	Insertion	5/05/21	
45	Deletion	6/05/21	
46	Tutorial	7/05/21	

UNIT-V: SEARCH TREES

CO5: AVL trees, operations of AVL trees, Red- Black trees, Splay trees, comparison of search trees.

TB:" Data Structures, Algorithms and Applications in java, 2/e, Sartaj Sahni,University Press "

47	Search Trees- AVL Trees	10/05/21	Lecture interspersed with discussions
48	Definition	11/05/21	
49	Height of AVL Tree	12/05/21	
50	Operations-, Insertion	14/05/21	
51,52	Deletion and Searching	15/05/21 18/05/21	
53	Introduction to Red-Black and Splay Trees	19/05/21	
54,55	B-Trees	20/05/21 22/05/21	
56	Height of B-Tree	24/05/21	
57	Insertion	25/05/21	
58	Deletion and Searching	26/05/21	
59	Comparison of Search Trees	27/05/21	
60	Tutorial	29/05/21	

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Department of Computer Science and Engineering

TENTATIVE LESSON PLAN: (M5805)
ADVANCED OPERATING SYSSTEMS

Course Title: Advanced Operating Systems (M5805)		
Section : M Tech-CSE	**Date: 20/02/2021**	**Page No:** 01 of 3
Revision No : 00	**Prepared By : D V SUBBA RAO**	**Approved By : HOD**

Tools: Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
Unit-1: Distributed Operating Systems **CO1: Illustrate on the fundamental concepts of distributed operating systems, its architecture and distributed mutual exclusion** **TB: "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", Mukesh Singhal, Niranjan and G.Shivaratri, TMH, 2001**			
1	Architectures of Distributed Systems, System Architecture types	22/02/21	Lecture interspersed with discussions
2	issues in distributed operating systems, communication networks, communication primitives.	23/02/21	
3	Theoretical Foundations, inherent limitations of a distributed system, lamp ports logical clocks, vector clocks	24/02/21	
4	casual ordering of messages, global state, cuts of a distributed computation, termination detection	25/02/21	
5	Distributed Mutual Exclusion, introduction, the classification of mutual exclusion and associated algorithms	26/02/21	
6	The classification of mutual exclusion and associated algorithms a comparative performance analysis	27/02/21	
7	Tutorial	01/03/21	
UNIT-II: Distributed Deadlocks and Distributed Resource Management. **CO2: Analyze on deadlock detection algorithms and agreement protocols.** **TB: "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", Mukesh Singhal, Niranjan and G.Shivaratri, TMH, 2001**			
8	Distributed Deadlock Detection, Introduction	02/03/21	Lecture interspersed with discussions
9	Deadlock handling strategies in distributed systems	03/03/21	
10	Issues in deadlock detection and resolution	04/03/21	
11	Control organizations for distributed deadlock detection	05/03/21	
12	Centralized and distributed deadlock detection algorithms	08/03/21	
13	Hierarchical deadlock detection algorithms	10/03/21	

14	Agreement protocols-Introduction, the system model	11/03/21	
15	A classification of agreement problems	12/03/21	
16	Solutions to the Byzantine agreement problem	15/03/21	
17	Applications of agreement algorithms	17/03/21	
18	Distributed resource management: introduction-architecture	19/03/21	
19	Mechanism for building distributed file systems design issues	20/03/21	
20	Log structured file systems	22/03/21	
21	Tutorial	23/03/21	

UNIT-III: Distributed Share Memory, Distributed Scheduling, Failure Recovery and Fault Tolerance
CO3: Make use of algorithms for implementing DSM and its scheduling
TB: "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", Mukesh Singhal, Niranjan and G.Shivaratri, TMH, 2001

No. of Periods	TOPIC	Date	Mode of Delivery
22	Distributed shared memory, Architecture	25/03/21	Lecture interspersed with discussions
23	Algorithms for implementing DSM, memory coherence and protocols	26/03/21	
24	Design issues. Distributed Scheduling, introduction, issues in load distributing	29/03/21	
25	Components of a load distributing algorithm, stability, load distributing algorithm	30/03/21	
26	Performance comparison, selecting a suitable load sharing algorithm	1/04/21	
27	Requirements for load distributing task migration and associated issues	3/04/21	
28	Failure Recovery and Fault tolerance: introduction, basic concepts	13/04/21	
29	Classification of failures, backward and forward error recovery, backward error recovery	14/04/21	
30	Recovery in concurrent systems, consistent set of check points, synchronous and asynchronous check pointing and recovery	15/04/21	
31	Check pointing for distributed database systems, recovery in replicated distributed databases.	16/04/21	
32	Tutorial	17/04/21	

UNIT-IV: Protection and security
CO4: Apply protection and security in distributed operating systems.
TB: "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", Mukesh Singhal, Niranjan and G.Shivaratri, TMH, 2001

No. of Periods	TOPIC	Date	Mode of Delivery
33	Protection and security, preliminaries	19/04/321	

34	The access matrix model and its implementations	20/04/21	Lecture interspersed with discussions
35	The access matrix model and its implementations, safety	23/04/21	
36	Advanced models of protection	24/04/21	
37	Data security, cryptography	26/04/21	
38	Model of cryptography	28/04/21	
39	Conventional cryptography modern cryptography	29/04/21	
40	Private key cryptography, symmetric encryption	30/04/21	
41	Data encryption standard	1/05/21	
42	Public key cryptography	3/05/21	
43	Multiple encryptions	4/05/21	
44	Authentication in distributed systems	5/05/21	
45	Digital signature	6/05/21	
46	Tutorial	7/05/21	
UNIT-V: Multiprocessor operating systems, Database Operating systems. **CO5: Elaborate on concurrency control mechanisms in distributed database systems.** **TB: "Advanced concepts in operating systems: Distributed, Database and multiprocessor operatingsystems", Mukesh Singhal, Niranjan and G.Shivaratri, TMH, 2001**			
47	Multiprocessor operating systems, basic multiprocessor system architectures	10/05/21	Lecture interspersed with discussions
48	Inter connection networks for multiprocessor systems	11/05/21	
49	Caching hypercube architecture	12/05/21	
50	Multiprocessor Operating System, structures of multiprocessor operating system	14/05/21	
51	operating system design issues, threads	15/05/21	
52	Process synchronization and scheduling	18/05/21	
53	Database Operating systems: Introduction, requirements of a database operating system	19/05/21	
54	Concurrency control: Theoretical aspects, introduction, database systems	20/05/21	
55	the problem of concurrency control, serializability theory, concurrency control algorithms control model of database systems	22/05/21	
56	Introduction, basic synchronization primitives	24/05/21	
57	Lock based algorithms, timestamp-based algorithms	25/05/21	
58	optimistic algorithms, concurrency control algorithms	26/05/21	
59	Data replication	27/05/21	
60	Tutorial	29/05/21	

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Department of Computer Science and Engineering

TENTATIVE LESSON PLAN: M5807
INTERNET OF THINGS

Course Title: Internet of Things (M5807)		
Section : M TECH	Date : 20/02/2021	Page No : 01 of 03
Revision No : 00	Prepared By : M Naresh Babu	Approved By : HOD

Tools: Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
Unit-1 FUNDAMENTALS OF IOT **CO1: To Understand Smart Objects and IoT Architectures.** **TB:" Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madisetti, Universities Press, 2015"**			
1	FUNDAMENTALS OF IoT: Evolution of Internet of Things	22/02/21	Lecture interspersed with discussions
2	Enabling Technologies	23/02/21	
3	IoT Architectures	24/02/21	
4	oneM2M	25/02/21	
5	IoT World Forum (IoTWF) and Alternative IoT models	26/02/21	
6	Simplified IoT Architecture and Core IoT Functional Stack	27/02/21	
7	Fog, Edge and Cloud in IoT	01/03/21	
8	Functional blocks of an IoT ecosystem	02/03/21	
9	Sensors	03/03/21	
10	Actuators	04/03/21	
11	Smart Objects and Connecting Smart Objects	05/03/21	
12	Tutorial	08/03/21	
UNIT-II: IOT PROTOCOLS **CO2: To learn about various IOT-related protocols** **TB:" The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012 "**			
13	IoT PROTOCOLS: IT Access Technologies	10/03/21	Lecture interspersed with discussions
14	Physical and MAC layers	11/03/21	
15	topology and Security of IEEE 802.15.4	12/03/21	
16	802.15.4g	15/03/21	
17	802.15.4e	17/03/21	
18	1901.2a	19/03/21	
19	802.11ah and Lora WAN	20/03/21	
20	Network Layer: IP versions	22/03/21	
21	Constrained Nodes and Constrained Networks	23/03/21	
22	Optimizing IP for IoT: From 6LoWPAN to 6Lo	24/03/21	
23	Routing over Low Power and Lossy Networks	25/03/21	

24	Application Transport Methods: Supervisory Control and Data Acquisition	26/03/21	
25	Application Layer Protocols: CoAP and MQTT	29/03/21	
26	Tutorial	30/03/21	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-III: DESIGN AND DEVELOPMENT **CO3: To build simple IoT Systems using Arduino and Raspberry Pi.** **TB:" Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Michahelles and Florian (Eds), Springer, 2011."**			
27	DESIGN AND DEVELOPMENT: Design Methodology	01/04/21	Lecture interspersed with discussions
28	Embedded computing logic	03/04/21	
29	Microcontroller	13/04/21	
30	System on Chips	14/04/21	
31	IoT system building blocks	15/04/21	
32	Arduino Board details	16/04/21	
33	IDE programming	17/04/21	
34	Raspberry Pi	19/04/21	
35	Interfaces and Raspberry Pi with Python Programming	20/04/21	
36	Tutorial	22/04/21	
UNIT-IV: DATA ANALYTICS AND SUPPORTING SERVICES **CO4: To understand data analytics and cloud in the context of IoT** **TB:" Internet of Things: Architecture, Design Principles And Applications, Rajkamal, McGraw Hill Higher Education"**			
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
37	DATA ANALYTICS AND SUPPORTING SERVICES: Structured Vs Unstructured Data	23/04/21	Lecture interspersed with discussions
38	Data in Motion Vs Data in Rest	24/04/21	
39	Role of Machine Learning	26/04/21	
40	No SQL Databases	28/04/21	
41	Hadoop Ecosystem	29/04/21	
42	Apache Kafka	30/04/21	
43	Apache Spark	01/05/21	
44	Edge Streaming Analytics and Network Analytics	03/05/21	
45	Xively Cloud for IoT	04/05/21	
46	Python Web Application Framework	05/05/21	
47	Django	06/05/21	
48	AWS for IoT	07/05/21	
49	System Management with NETCONF-YANG	10/05/21	

50	Tutorial	11/05/21	
UNIT-V: CASE STUDIES/INDUSTRIAL APPLICATIONS **CO5: To develop IoT infrastructure for popular applications** **TB:" IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017"**			
51	CASE STUDIES/INDUSTRIAL APPLICATIONS: Cisco IoT system	12/05/21	Lecture interspersed with discussions
52	IBM Watson IoT platform	14/05/21	
53	Manufacturing	15/05/21	
54	Converged Plant wide Ethernet Model (CPwE)	18/05/21	
55	Power Utility Industry	19/05/21	
56	Grid Blocks Reference Model	20/05/21	
57	Smart and Connected Cities: Layered architecture	22/05/21	
58	Smart Lighting	24/05/21	
59	Smart Parking Architecture	25/05/21	
60	Smart Traffic Control	26/05/21	
61	Tutorial	27/05/21	

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