MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	:	Department of Information and Communication Technology
Course Name & code	:	**OPERATING SYSTEMS & ICT 2258**
Semester & branch	:	IV & IT AND CCE
Name of the faculty	:	Mrs. Anuradha Rao
No of contact hours/week:		L: 3 | T: 1 | P: 0 | C: 4

Course Outcomes (COs)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks
CO1:	Acquire detailed understanding of operating system functionalities.	20	42
CO2:	Apply the knowledge to solve issues in process as well as memory management	22	46
CO3:	Able to understand the fundamental concepts of real time operating systems	03	6
CO4:	Apply the knowledge to understand modern operating systems concepts	03	6
CO5:			
	Total	48	100

Assessment Plan

Components	Assignments	Sessional Tests	End Semester/ Make-up Examination
Duration	20 to 30 minutes	60 minutes	180 minutes
Weightage	20 % (4 X 5 marks)	30 % (2 X 15 Marks)	50 % (1 X 50 Marks)
Typology of Questions	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation	Knowledge/ Recall; Understanding/ Comprehension; Application	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation
Pattern	Answer one randomly selected question from the problem sheet (Students can refer their class notes)	MCQ: 10 questions (0.5 marks) Short Answers: 5 questions (2 marks)	Answer all 5 full questions of 10 marks each. Each question may have 2 to 3 parts of 3/4/5/6/7 marks
Schedule	4, 7, 10, and 13th week of academic calendar	Calendared activity	Calendared activity
Topics Covered	Quiz 1 (L 1-12 & T 1-4) (CO1,CO2)	Test 1 (L 1-21 & T 1-7) (CO1, CO2)	Comprehensive examination covering full syllabus. Students are expected to answer all questions (CO1-5)
	Quiz 2 (L **13-21** & T 5-7) (CO1,CO2)		
	Quiz 3 (L 22-30 & T 8-10) (CO1,CO2)	Test 2 (L 22-34 & T 8-11) (CO1,CO2,CO3,CO4)	
	Quiz 4 (L 31-36 & T 11-12) (CO3,CO4)		

Lesson Plan

L. No.	Topics	Course Outcome Addressed
L0	Introduction to the course	-
L1	Introduction to Operating system, Operating system structure	CO1
L2	Operating system operations, Distributed systems	CO1
L3	Special purpose systems, Computing environments, Open Source operating systems	CO1
T1	Questions based on lectures L1-L3	CO1
L4	Process concept: Process states, Process control block, Scheduling queues	CO1
L5	Schedulers, Context switch, Process creation , Process termination	CO1
L6	Inter-process communication, Case study of Unix	CO2
T2	Questions based on lectures L4-L6	CO1
L7	Multithreaded programming: Overview, Multithreading models, Threading issues	CO1

L8	Process scheduling: Basic concepts, Scheduling criteria	CO1
L9	Scheduling algorithms	CO2
T3	Questions based on lectures L7-L9	CO2
L10	Scheduling algorithms	CO2
L11	Scheduling algorithms	CO2
L12	Scheduling algorithms	CO2
T4	Questions based on Scheduling algorithms lectures L10-L12	CO2
L13	Process Synchronization: Background, The Critical section problem	CO1
L14	Dekker's algorithms, Synchronization hardware	CO2
L15	Semaphores	CO2
T5	Questions based on critical section L13-L15	CO2
L16	Classic problems of synchronization: Bounded buffer problem	CO1
L17	The readers-writers problem	CO2
L18	Dining philosophers problem, Process synchronization with monitors	CO2
T6	Question based on process synchronization L16-L18	CO2
L19	Deadlocks: Deadlock characterization, resource allocation graph	CO1
L20	Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance	CO1
L21	Deadlock avoidance: Banker's algorithm, Deadlock detection, Recovery from deadlock	CO2
T7	Questions based on deadlock avoidance lectures from L19-L21	CO2
L22	Memory management: Main Memory: Background	CO1
L23	Swapping	CO1
L24	Contiguous memory allocation	CO1
T8	Questions based on memory management lectures L22-L24	CO1
L25	Paging	CO1
L26	Structure of the page table	CO1
L27	Segmentation. Case Study of Unix based OS	CO2
T9	Questions based on Paging lectres L25-L27	CO2
L28	Virtual Memory: Background, Demand paging, copy on write, Basics of page replacement,	CO1
L29	FIFO page replacement algorithms, Optimal page replacement algorithms	CO2

L30	LRU page replacement algorithms, Allocation of frames, Thrashing	CO2
T10	Questions based on page replacement algorithms lectures L28-L30	CO2
L31	Storage Management: File Concept, File Access methods, directory structure, file structure, Directory implementation	CO1
L32	Allocation methods, Free space management, Disk structure	CO1
L33	Disk scheduling algorithms: FCFS, SSTF, SCAN	CO2
T11	Questions based on disk scheduling lecture L31-33	CO2
L34	Characteristics of Real time operating systems, classification of real time systems,	CO3, CO4
L35	Micro kernels and RTOS, scheduling in RTOS, Rate monotonic scheduling, EDF, Priority inversion	CO3, CO4
L36	Rate monotonic scheduling, EDF, Priority inversion	CO3, CO4
T12	Questions based on lectures L34-L36	CO3, CO4

References:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Concepts 9(e), Wiley, 2012.
2. William Stallings, Operating Systems: Internals and Design Principles 9(e), Pearson, 2017.
3. Phillip A Laplante, Seppo J Ovaska, Real time systems design and analysis 4(e), Wiley,2013
4. Rajib Mall, Real time systems: Theory and Practice 2(e), Pearson, 2009.
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Submitted by: MRS. ANURADHA RAO

ARao

(Signature of the faculty)

Date: 04-01-2018

Approved by: DR. BALACHANDRA

(Signature of HOD)

Dr. Balachandra
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Date: 04-01-2020

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY	SECTION	FACULTY	SECTION
Sangeetha T S	CCE A		
Anuradha Rao	CCE B		
Veena K M	IT A		
Chetana Pujari	IT B		

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