Critical System Design   I sem Mtech   Computer Engineering

S.NO.	UNIT	LECTURE	CONTENTS
1	**INTRODUCTION**	LECTURE1	Introduction: Definition, Typical Real Time Applications
		LECTURE2	concept of tasks,
		LECTURE3	types of tasks and real time systems,
		LECTURE4	block diagram of RTS,
		LECTURE5	and tasks parameters -Release Times,
		LECTURE6	execution time, period,
		LECTURE7	Deadlines, and Timing Constraints etc.
		LECTURE8	RTS requirements.
2	**REFERENCE MODELS AND REAL TIME SCHEDULING**	LECTURE9	Reference Models for Real Time Systems: processors and Resources, Temporal Parameters of Real-Time Workload,
		LECTURE10	Periodic and Aperiodic Task Model, Precedence Constrains Types
		LECTURE11	Data Dependency, Other of Dependencies,
		LECTURE12	Functional Parameters, Resource Parameters.
		LECTURE13	Real Time Scheduling: classification of Real Time Scheduling, scheduling criteria, performance metrics,
		LECTURE14	schedulability analysis, Introduction to Clock Driven scheduling, Weighted Round Robin Approach
		LECTURE15	Priority Driven Approach. Dynamic Versus Static systems, Offline Versus Online Scheduling.
3	**PERIODIC TASKS AND PRIORITY DRIVEN SCHEDULING**	LECTURE16	Periodic tasks scheduling: Clock Driven Scheduling – definition, notations and assumption,
		LECTURE17	scheduler concepts, general scheduling structure, cyclic executives.
		LECTURE18	Priority Driven Scheduling; notations and assumption, algorithms, practical factors.
		LECTURE19	scheduling algorithms, fixed priority verses dynamic priority,
		LECTURE20	fixed priority scheduling algorithms
		LECTURE21	(RM and DM) and their schedulability analysis,

		LECTURE22	concept of schedulability tests – Inexact and exact schedulability tests for RM and DM and DM
		LECTURE23	Optimality of the RM
4	**APERIODIC TASK SCHEDULING AND FLEXIBLE COMPUTATIONS**	LECTURE24	Aperiodic task scheduling;
		LECTURE25	assumption and approaches to Aperiodic scheduling,
		LECTURE26	server based and non-server based fixed priority scheduling algorithms
		LECTURE27	polling server, deferrable server , simple sporadic server, priority exchange,
		LECTURE28	extended priority exchange, slack stealing..
		LECTURE29	Introduction to scheduling of flexible computations –
		LECTURE30	Flexible applications,
		LECTURE31	imprecise computation model
		LECTURE32	and firm deadline model
5	**RESOURCES ACCESS CONTROL**	LECTURE33	Resources Access Control: Assumptions on Resources and their usage,
		LECTURE34	Effect of Resource Contention and Resource Access Control (RAC), Non-preemptive Critical Sections,
		LECTURE35	priority inversion problem, need of new resource synchronization primitives/protocols for RTS,
		LECTURE36	Basic Priority-Inheritance and Priority-Ceiling Protocols,
		LECTURE37	Stack Based Priority-Ceiling Protocol, Use of Priority- Ceiling Protocol in Dynamic Priority Systems,
		LECTURE38	Preemption Ceiling Protocol,
		LECTURE39	Access Control in Multiple- Unit Resources,
		LECTURE40	Controlling Concurrent Accesses to Data Objects.