DEPARTMENT OF COMPUTER ENGINEERING,
RAJASTHAN TECHNICAL UNIVERSITY, KOTA
LECTURE PLAN OF SUBJECT: Operating System (5CS)
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S.No.	UNIT NAMES	Lectures	Contents of the Lectures
1	**Introduction of OS & Process management**	1	Introduction and need of operating system,
		2	layered architecture/logical structure of operating system
		3	Type of OS, operating system as resource manager and virtual machine
		4	OS services, BIOS, System Calls/Monitor Calls ,Firmware- BIOS, Boot Strap Loader
		5	Process model, creation, termination, states &transitions
		6	Process hierarchy, context switching, process implementation, process control block
		7	Basic System calls- Linux &Windows, Threads-processes versus threads, threading concepts
		8	kernel &user level threads, thread usage, benefits, multithreading models
2	**Interprocess communication & Process scheduling**	9	Introduction to message passing, Race condition
		10	Critical section problem
		11	mutual exclusion with busy waiting disabling interrupts.
		12	lock variables, strict alteration, Peterson's solution
		13	TSL instructions, busy waiting, sleep and wakeup calls
		14	semaphore, monitors , classical IPC problems
		15	Basic concepts of scheduling,classification,
		16	CPU and I/O bound, CPU schedulershort, medium, long-term dispatcher
		17	scheduling:- preemptive and non-preemptive, Static and Dynamic Priority, Co-operative & Non-cooperative, Criteria/Goals/Performance Metrics,
		18	scheduling algorithms- FCFS, SJFS,shortest remaining time, Round robin, Priority scheduling,
		19	multilevel queue scheduling, multilevel feedback queue scheduling, Fair share scheduling
		20	Converting ASM charts to hardware, one hot state assignment
3	**Deadlock & Memory management**	21	methods for deadlock handling, deadlock prevention,
		22	deadlock avoidance, deadlock detection recovery from deadlock.
		23	Memory management concepts, functions
		24	logical and physical address space, address binding,
		25	degree of multiprogramming, swapping, static & dynamic loading- creating a load module, loading
		26	static & dynamic linking, shared libraries,memory allocation schemes first fit, next fit, best fit, worst fit, quick fit.
		27	Free space management- bitmap, link list/free list,
		28	buddy's system, memory protection and sharing, relocation and address translation.
		29	concept, virtual address space, paging scheme

4	**Virtual Memory**	30	pure segmentation and segmentation with paging scheme hardware support and implementation details,
		31	memory fragmentation, demand paging,
		32	pre-paging, working set model, page fault frequency, thrashing,
		33	page replacement algorithms- optimal, NRU, FIFO, second chance, LRU, LRUapproximation clock,
		34	WS clock; Belady's anomaly, distance string; design issues for paging system
		35	local versus global allocation policies, load control, page size,
		36	separate instruction and data spaces, shared pages, cleaning policy
		37	TLB (translation look aside buffer) reach, inverted page table
		38	I/O interlock, program structure, page fault handling,Basic idea of MM in Linux & windows.
		39	File System 's concepts, naming, attributes, operations, types, structure
5	**File System & Input/Output subsystems**	40	file organization & access(Sequential, Direct ,Index Sequential) methods,
		41	memory mapped files, directory structures- one & two level, hierarchical/tree, graph, file system
		42	mounting, file sharing, path name, directory operations
		43	overview of file system in Linux & windows.
		44	Input/Output subsystems 'sconcepts, functions/goals, input/output devices- block and character
		45	spooling, disk structure & operation, disk attachment, disk storage capacity,
		46	disk scheduling algorithm- FCFS, SSTF, scan scheduling, C-scan schedule.