



National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Computer Science and Engineering	Year of Regulation	2019-20
Department	Computer Science and Engineering	Semester	V

Course Code	Course Name	Credit Structure				Marks Distribution				
		L	T	P	C	INT	MID	END	Total	
CS301	Operating Systems	3	1	0	4	50	50	100	200	
Course Objectives	To introduce the components of operating system	Course Outcomes	CO1	Able to learn the fundamentals of Operating Systems						
	To analyse the process scheduling and execution		CO2	Able to acquire knowledge about different process scheduling techniques.						
	To describe the structure of main memory, virtual memory		CO3	Able to solve process synchronization and deadlock handling strategies						
	To describe the function of file systems		CO4	Able to acquire knowledge about different memory management techniques and page replacement algorithms.						
	To explore the structure of an operating system's I/O subsystem and hardware.		CO5	Able to describe file concepts and analyse various disk scheduling and storage strategies						

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	2	0	0	0	0	0	0	0	0	0	0	0	2	1	0
2	CO2	2	1	1	1	0	0	0	1	0	0	1	1	2	1	1
3	CO3	2	2	2	1	0	0	0	0	0	0	0	1	2	1	1
4	CO4	2	2	2	2	0	0	0	0	1	0	1	1	1	1	1
5	CO5	1	0	1	1	0	0	0	0	0	0	0	1	1	1	0

SYLLABUS

No.	Content	Hours	COs
I	Introduction Operating Systems Functionalities - Formal Definition - Evolution – Types of operating system, Services, Operating system Design and Implementation, Operating System Structure.	06	CO1
II	Process Management Process concept - Process control block, Process Hierarchy, Threads – Single Thread and Multi Thread Model, IPC models: shared memory and message passing. CPU Scheduling algorithms, Multiprocessor Scheduling, Process Synchronization - Peterson's Solution, Process Synchronization - Semaphores, Critical Regions, Monitors - Deadlock prevention- Deadlock avoidance and Deadlock Detection and Recovery - Bankers Algorithm.	16	CO2, CO3
III	Memory Management Overview of Swapping - Multiple Partitions – Paging, Page table, Segmentation, Demand paging- Fragmentation & Compaction- Page replacement algorithms, Memory allocation algorithms: first fit, Best fit, worst fit.	14	CO1, CO4
IV	File System Access Methods, Contiguous-Sequential and Indexed Allocation, File system interface - File System implementation, Secondary Storage Structure.	08	CO1, CO5
V	I/O System RAID-disk scheduling- Device drivers - block and character devices-streams, Character and Block device switch tables	04	CO1, CO5
Total Hours		48	

Essential Readings

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, "Operating System Concepts", 9th Edition, John Wiley & Sons Inc. 2012.
2. Andrew S Tanenbaum, "Modern Operating Systems", 4th Edition, Prentice Hall. 2014
3. William Stallings, "Operating System: Internals and Design Principles", 9th Edition, Pearson, 2018.

Supplementary Readings

1. Harvey M. Deitel, Paul J. Deitel, David R. Choffnes, "Operating System", 3rd Edition, Pearson, 2013.
2. D M Dhamdhare, "System Programming and Operating Systems", 2nd Edition, Tata McGraw Hill, 2009.
3. Gary Nutt, " Operating Systems: A Modern Perspective", 2nd Edition, Addison Wesley, 2001.
4. Achyut S Godbole, "Operating Systems", 3rd Edition, Tata McGraw Hill, 2010.