National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	**Master of Computer Applications**	Year of Regulation	**2024-25**
Department	**Computer Science and Engineering**	Semester	**III**

Course Code	Course Name	Pre-Requisite	Credit Structure				Marks Distribution		
			L	T	P	C	Continuous Evaluation	Quiz/ Viva	Total
CA551	**Operating Systems Lab**		**0**	**1**	**2**	**2**	**70**	**30**	**100**

Course Objectives		Course Outcomes	CO's	Statement	Bloom's Taxonomy
	To introduce the components of operating system		CA551.1	**Able to understand the fundamentals of Operating Systems**	**understand**
	To analyse the process scheduling and execution		CA551.2	**Able to acquire knowledge about different process scheduling techniques.**	**acquire knowledge**
	To describe the structure of main memory, virtual memory		CA551.3	**Able to evaluate process synchronization and deadlock handling strategies**	**evaluate**
	To describe the function of file systems		CA551.4	**Able to acquire knowledge about different memory management techniques and page replacement algorithms.**	**acquire knowledge**

COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CA551.1	**2**												**2**	**1**	
CA551.2	**2**	**1**	**1**	**1**				**1**			**1**	**1**	**2**	**1**	**1**
CA551.3	**2**	**2**	**2**	**1**								**1**	**2**	**1**	**1**
CA551.4	**2**	**2**	**2**	**2**					**1**		**1**	**1**	**1**	**1**	**1**
CA551	**2**	**1.25**	**1.25**	**1**				**0.25**	**0.25**		**0.5**	**0.75**	**1.75**	**1**	**0.75**

SYLLABUS

No.	Content	Hours	COs
I	**Basic Commands of UNIX, Shell Programming, Implementation of CPU scheduling algorithms, Performance Comparison of CPU scheduling algorithms. Implementation of IPC.**	**08**	**CO1 CO2 CO3 CO4**
II	**Implementation of Peterson's Solution, Semaphores, Monitors**	**06**	
III	**Classical Process Coordination & Synchronization Problems like, Bounded Buffer, Producer- Consumer, Readers-Writers, Dinning philosophers, The Cigarette-Smokers Problem, Dining-Philosophers Solution Using Monitors**	**08**	
IV	**Implementation of Deadlock Avoidance Algorithms, Detection Algorithms**	**03**	
V	**Implementation of contiguous memory allocation techniques, Paging Techniques, Page Replacement Algorithms, Disk Scheduling Algorithms**	**03**	
	To be done necessarily as mini-project group-wise in groups of at least two/three students.		
Total Hours		**28**	

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 Dhamdhere, "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.