



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Master of Technology in VLSI and Embedded Systems										Year of Regulation			2018-19			
Department	Electronics and Communication Engineering										Semester			II			
Course Code	Course Name									Credit Structure				Marks Distribution			
										L	T	P	C	INT	MID	END	Total
EC 526	REAL TIME OPERATING SYSTEMS									3	0	0	3	50	50	100	200
Course Objectives	Understand the concepts of RTOS and basic Parallel programming principles									Course Outcomes	CO1	Able to realise Basic concepts of such as task, threads, task scheduling, and memory allocation, File system, data management etc					
	Evaluate scheduling algorithms and Resource sharing and access control										CO2	Ability to choose between different programming techniques in RTOS-based applications					
	Study state machines approaches RTOS										CO3	Ability to design RTOS systems with timed petrinets and fsms					
	Program real-time operating systems on Arm-based platforms and use them to improve their application performance										CO4	Ability to optimize the RTOS to satisfy given user specifications					
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	3	2	2	1	2	1	-	-	2	-	-	1	3	3	1	
2	CO2	1	2	1	3	-	-	1	-	3	-	-	1	2	2	1	
3	CO3	2	3	3	1	2	0	-	1	0	-	1	2	3	2	1	
4	CO4	1	2	3	0	2	2	2	-	2	-	-	1	1	2	3	
SYLLABUS																	
No.	Content													Hours	COs		
I	Review of Operating Systems Basic Principles – System Calls – Files – Processes – Design and Implementation of processes – Communication between processes – Operating System structures.													6	CO1		
II	Distributed Operating Systems Topology – Network types – Communication – RPC – Client server model – Distributed file system – Design strategies.													8	CO1		
III	Real Time models and Languages Event Based – Process Based and Graph based Models – Petrinet Models – Real Time Languages – RTOS Tasks – RT scheduling - Interrupt processing – Synchronization – Control Blocks – Memory Requirements.													10	CO2, C03		
VI	Real Time Kernel Principles – Design issues – Polled Loop Systems – RTOS Porting to a Target – Comparison and study of RTOS VX works and COS – Case studies.													8	CO4		
V	RTOS Application Domains RTOS for Image Processing – Embedded RTOS for voice over IP – RTOS for fault Tolerant Applications – RTOS for Control Systems - RTOS for embedded system applications.													6	CO4		
Total Hours													38				
Essential Readings																	
1. C. Crowley, Operating Systems-A Design Oriented approach, McGraw Hill, 1st Edition, 1997.																	
2. C.M. Krishna, Kang, G. Shin, Real Time Systems, McGraw Hill, 1st Edition, 1997.																	
Supplementary Readings																	
1. T. Andrew, Distributed Operating Systems, Pearson Education, 1st Edition, 2002.																	
2. R. J.A.Bhur, D. L. Bailey, An Introduction to Real Time Systems: From Design to Networking with C/C++, PHI, 1st Edition, 1999.																	