

**DEPARTMENT OF COMPUTER APPLICATIONS NATIONAL INSTITUTE OF  
TECHNOLOGY, TIRUCHIRAPPALLI**

<b>COURSE PLAN – PART I</b>			
<b>Name of the programme and specialization</b>	MCA		
<b>Course Title</b>	Operating Systems		
<b>Course Code</b>	CA714	<b>No. of Credits</b>	3
<b>Course Code of Pre-requisite subject(s)</b>	CA715 (Computer Organization and Architecture)		
<b>Session</b>	Jan-2022	<b>Section (if, applicable)</b>	B
<b>Name of Faculty</b>	Dr. B.Balaji	<b>Department</b>	Computer Applications
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<b>Name of PAC Chairman</b>	Dr. B.Janet		
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<b>Course Type</b>	Core		
<b>Syllabus (approved in BoS)</b>			
<p>Operating System concept- OS Structure –Services-System calls – Process Management-Process Concept-Operations on process-Cooperating processes- Inter-process communication-Process Scheduling-Scheduling Algorithms-Threads- Multithreading models.</p> <p>Process synchronization- critical-section problem – Synchronization hardware –Semaphores – Classic problems of synchronization – critical regions – Monitors Deadlock- Deadlock characterization – Methods for handling deadlocks – Recovery from deadlock</p> <p>Memory management-Buddy System-Paging-segmentation-Virtual Memory –Demand paging-Page replacement algorithms – Allocation of frames – Thrashing-Working set model</p> <p>Files and Directories - Files System structure- Implementation –File allocation methods-Free space management- <b>Virtualization – Containers</b></p> <p>I/O systems – I/O interface –Kernel I/O subsystem. Disk scheduling algorithms- Disk Management- Swap space management</p> <p>Protection and security -Case Study-Linux, Windows, Mac OS and Mobile OS</p> <p><b>References:</b></p> <ol style="list-style-type: none"> <li>1. Silberschatz, Galvin and Gagne, “Operating System Concepts”, 9th Edition, John Wiley &amp; Sons Inc., 2013.</li> <li>2. Andrew S. Tanenbaum, “Modern Operating Systems”, 4<sup>th</sup> Edition, Prentice-Hall of India, 2007</li> <li>3. SibsankarHaldar, Alex A.Aravind, “Operating systems”, Pearson Education, 2009.</li> </ol>			
<b>COURSE OBJECTIVE(S)</b>			
The student will be able to understand operating systems and analyze the process scheduling algorithms and resource sharing among the processes.			
<b>COURSE OUTCOMES (CO)</b>			

Course Outcomes	Aligned Programme Outcomes (PO)
Students will be able to:	
1. Use systems calls for managing processes, memory, and the file systems	I, II, III,IV
2. Be familiar with various types of operating system structures for examples Linux, Windows, Mac OS and Mobile OS.	I, II, III,IV, V, VII, IX
3. Explore the functionalities of the operating systems with numerical examples.	I, II, III,IV, V, VII, IX, X, XII

COURSE PLAN - PART II			
COURSE OVERVIEW			
This course focuses on how the operating system effectively manages the system resources. The objective of this course is to provide classical internal algorithms and structures of operating systems, including CPU scheduling, memory management and file management concepts.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/ Contact Hours	Topic	Mode of Delivery
1	Week 1 (3 Classes)	introduction to operating system & system calls	Online teaching modes with online tools
2	Week 2 (3 Classes)	process management	Online teaching modes with online tools
3	Week 3 (3 Classes)	CPU Scheduling algorithms	Online teaching modes with online tools
4	Week 4 (3 Classes)	Inter-process Communications	Online teaching modes with online tools
5	Week 5 (3 Classes)	Process Synchronization & Semaphore	Online teaching modes with online tools
6	Week 6 (3 Classes)	Threads	Online teaching modes with online tools
7	Week 7 (3 Classes)	Memory management & paging segmentation	Online teaching modes with online tools
8	Week 8 (3 Classes)	page replacement algorithms	Online teaching modes with online tools
9	Week 9 (3 Classes)	Allocation of frames & working set model	Online teaching modes with online tools
10	Week 10 (3 Classes)	Files and Directories	Online teaching modes with online tools
11	Week 11 (3 Classes)	File allocation methods & free space management	Online teaching modes with online tools
12	Week 12 (3 Classes)	I/O Systems & interface	Online teaching modes with online tools
13	Week 13 (3 Classes)	Disk scheduling algorithms	Online teaching modes with online tools

	Classes)		
14	Week 14 (3 Classes)	Disk management-Swap space management	Online teaching modes with online tools

COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	6 <sup>th</sup> Week	60 Minutes	25
2	Assignment 1 /Quiz/Viva/Seminar	8 <sup>th</sup> week	-	10
3	Cycle Test 2	10 <sup>th</sup> Week	60 Minutes	25
4	Assignment 2 /Quiz/Viva/Seminar	11 <sup>th</sup> week	-	10
5*	<b>Compensation Test</b>	12 <sup>th</sup> week	60 Minutes	25
6	Final Assessment	-	120 Minutes	30
<p><b>ATTENDANCE POLICY</b> (A uniform attendance policy as specified below shall be followed)</p> <ul style="list-style-type: none"> <li>➤ At least 75% attendance in each course is mandatory.</li> <li>➤ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.</li> </ul>				
<p><b>ACADEMIC DISHONESTY &amp; PLAGIARISM</b></p> <ul style="list-style-type: none"> <li>➤ Talking to other students, copying from others during an assessment will be treated as punishable dishonesty.</li> <li>➤ Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.</li> <li>➤ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.</li> </ul> <p>The above policy against academic dishonesty shall be applicable for all the programmes.</p>				
<b>ADDITIONAL INFORMATION</b>				
Students can contact the faculty to clarify their doubts in person anytime during working hours.				
<b>Compensation assessment policy:</b>				
To be absent from cycle test 1 and 2 prior permission from faculty is required.				
<b>FOR APPROVAL</b>				
<p>Course Faculty : <u>Dr.B.Balaji</u>      CC-Chairperson <u>[Signature]</u>      HOD <u>[Signature]</u></p> <p style="text-align: center;">17/02/2022</p>				