

**NATIONAL INSTITUTE OF TECHNOLOGY,  
TIRUCHIRAPPALLI**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

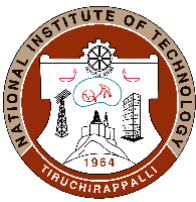
COURSE PLAN – PART I			
<b>Name of the programme and specialization</b>	<b>B.TECH. (CSE)</b>		
<b>Course Title</b>	<b>OPERATING SYSTEMS</b>		
<b>Course Code</b>	<b>CSPC43</b>	<b>No. of Credits</b>	<b>3</b>
<b>Course Code of Pre-requisite subject(s)</b>			
<b>Session</b>	<b>January 2021</b>	<b>Section (if, applicable)</b>	<b>B</b>
<b>Name of Faculty</b>	<b>Dr. S. Mary Saira Bhanu</b>	<b>Department</b>	<b>CSE</b>
<b>Official Email</b>	<b>msb@nitt.edu</b>	<b>Telephone No.</b>	<b>9442970006</b>
<b>Name of Course Coordinator(s) (if, applicable)</b>	<b>Not Applicable</b>		
<b>Official E-mail</b>		<b>Telephone No.</b>	
<b>Course Type (please tick appropriately)</b>	<input checked="" type="checkbox"/> <b>Core course</b>	<input type="checkbox"/> <b>Elective course</b>	
<b>Syllabus (approved in Senate)</b>			
UNIT I Introduction Need for Operating Systems - Computer Systems - OS Operations - Abstract view of OS - Virtualization - Computing Environments - OS Services - OS Structures - System Calls - Building and Booting OS - Process - Threads - Multithreading. UNIT II Process Management Process Scheduling - Process Co-ordination - Synchronization - Semaphores - Monitors - Hardware Synchronization - Deadlocks - Methods for Handling Deadlocks. UNIT III Memory Management Memory Management Strategies - Contiguous and Non-Contiguous allocation - Virtual memory Management - Demand Paging - Page Placement and Replacement Policies. UNIT IV File Management File System - Basic concepts - File System design and Implementation - Case Study: Linux File Systems – Mass Storage Structure - Disk Scheduling - Disk Management - I/O Systems - System Protection and Security. UNIT V Distributed Systems Distributed Systems - Distributed operating systems - Distributed file systems - Distributed Synchronization – OS architecture - Case study on LINUX and Windows OS. Text Book 1. Silberschatz, Galvin,Gagne, “Operating System Concepts” , Tenth Edition, John Wiley and Sons, 2018.  Reference Books 1. William Stallings, “Operating Systems – Internals and Design principles”, Eighth Edition, Pearson Publications, 2014. 2. Andrew S. Tanenbaum, “Modern Operating Systems”, Fourth Edition, Pearson Publications, 2014. 3. Dhananjay M. Dhamdhere, Operating Systems - A Concept-Based Approach Third Edition, Tata McGraw Hill Education, 2012.			
<b>COURSE OBJECTIVES</b>			



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<p>To provide knowledge about the services rendered by operating systems</p> <p>To explore the various scheduling policies and to provide solutions for critical section and deadlock problems</p> <p>To provide a detailed discussion of the various memory management techniques</p> <p>To discuss the various file-system design and implementation issues</p> <p>To discuss how the protection domains, help to achieve security in a system</p> <p>To explore the design and implementation issues of Distributed OS</p>	
<b>MAPPING OF COs with POs</b>	
<b>Course Outcomes</b>	<b>Programme Outcomes (PO) (Enter Numbers only)</b>
1. Comprehend the techniques used to implement the process manager	<b>PO1,PO3,PO5,PO7, PO11</b>
2. Comprehend virtual memory abstractions in operating systems	<b>PO1,PO3,PO7, PO12</b>
3. Design and develop file system and I/O system	<b>PO1,PO3,PO7,PO12</b>
4. Apply various mechanisms in storage management	<b>PO1,PO3,PO7,PO12</b>
5. Design and develop OS modules for Distributed Environment	<b>PO1,PO2,PO5,PO9, PO10, PO11</b>

<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
<p>This course enables the students to know the importance of Operating System (OS) and understand how OS services are implemented and used. The course focuses on the basic conceptual issues in the design of OS and introduces the basic facilities provided in modern operating systems. Also the models of OS from the Uniprocessor to Multiprocessor perspectives by considering the purpose, structure and functions of operating systems are dealt in this course.</p>			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			( Add more rows)
<b>S.No.</b>	<b>Week</b>	<b>Topic</b>	<b>Mode of Delivery</b>
1	1	Need for Operating Systems, , OS Components, OS operations, Abstract view of OS, Virtualization, OS services, OS Structures	ONLINE PPT
2	2	Types of OS, Computer System operations - System Calls, Building and Booting OS, Virtual Machines	ONLINE PPT
3	3	Process Concepts- Threads, multithreading, Process Scheduling,	ONLINE PPT

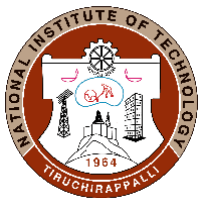


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4	4	Inter process communication, Coordination and synchronization Semaphores, Monitors hardware Synchronization,	ONLINE PPT
5	5	Deadlocks, Deadlock characteristics, Methods for handling deadlocks Case study : Linux and Windows	ONLINE PPT
6	6	Memory management concepts, Contiguous and Non Contiguous allocation – Single process Monitor, Static and Dynamic Partition Memory Management	ONLINE PPT
7	7	Segmentation- Paging memory Management	ONLINE PPT
8	8	Virtual memory management, Demand paging, Allocation of frames, Page Replacement; Case study: Linux and Windows	ONLINE PPT
9	9	File System Basics- File system interfaces – File System implementation	ONLINE PPT
10	10	Mass Storage Management, Disk Scheduling, RAID, Swap Space management	ONLINE PPT
11	11	I/O Management – I/O interfaces – Streams	ONLINE PPT
12	12	Protection and Security – Access Control mechanisms –Program Threats – Use of Cryptography	ONLINE PPT
13	13	Distributed systems –Distributed Operating systems – Design issues	ONLINE PPT
14	14	Distributed Synchronization – Distributed File System	ONLINE PPT

**COURSE ASSESSMENT METHODS (shall range from 4 to 6)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Written Test	As per Academic Schedule	1 hour	20%



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2	Written Assignment	March I week		15%
3	Written Test	As per Academic Schedule	1 hour	20%
4	Programming Assignemnt	April I Week		15%
CPA	Compensation Assessment*	As per Academic Schedule	1 hour	20%
4	Final Assessment *	As per Academic Schedule	2 hours	30%

**COURSE EXIT SURVEY** (mention the ways in which the feedback about the course shall be assessed)

Student Feedback Form collected at the end of the semester through MIS

**COURSE POLICY** (including compensation assessment to be specified)

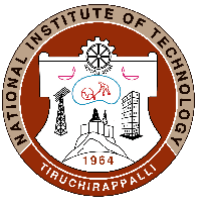
Students should not be absent for assessments. If the reason for absence is genuine, the student can appear for compensation assessment. The medical certificate/on duty certificate should be submitted within one week after rejoining. The portions for the compensation assessment will be Assessment 1 and Assessment 3 portions.

**ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- 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.



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The above policy against academic dishonesty shall be applicable for all the programmes.

**ADDITIONAL INFORMATION**

**FOR APPROVAL**

  
Course Faculty \_\_\_\_\_

  
CC-Chairperson \_\_\_\_\_

  
HOD \_\_\_\_\_