DEPARTMENT OFCOMPUTER SCIENCE & ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I

Course Title	Operating Systems		
Course Code	CSPC26	**No. of Credits**	3
Course Code of Pre-requisite subject(s)	CSPC24		
Session	Jan – May 2018	**Section**	A
Name of Faculty	Dr. S. Jaya Nirmala	**Department**	CSE
Email	sjaya@nitt.edu		
Course Type	Core course		

Syllabus (approved in BoS)

Unit – I

Operating Systems – Definition-Types - Functions - Abstract view of OS - System Structures –System Calls- Virtual Machines - Process Concepts -Threads - Multithreading

Unit –II

Process Scheduling- Process Co-ordination-Synchronization- Semaphores -Monitors – Hardware Synchronization -Deadlocks - Methods for Handling Deadlocks

Unit –III

Memory Management Strategies - Contiguous and Non-Contiguous allocation - Virtual memory Management – Demand Paging - Page Placement and Replacement Policies

Unit –IV

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 operating systems –Distributed file systems –Distributed Synchronization.

COURSE OBJECTIVES

- To provide knowledge about the services rendered by operating systems
- To provide a detailed discussion of the various memory management techniques
- To discuss the various file system design and implementation issues
- To discuss how the protection domains help to achieve security in a system

COURSE OUTCOMES (CO)

- Ability to comprehend the techniques used to implement the process manager
- Ability to comprehend virtual memory abstractions in operating systems
- Ability to design and develop file system interfaces.

Course Outcome (CO)	Aligned Programme Outcome							
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
Ability to comprehend the techniques used to implement the process manager	S	B	S	M	S	M	B	B
Ability to comprehend virtual memory abstractions in operating systems	M	B	S	B	M	B	B	B
Ability to design and develop file system interfaces	S	S	S	S	S	M	B	B

COURSE PLAN – PART II

COURSE OVERVIEW

The focus of this course is to understand the underlying technologies that make operating systems to work efficiently. The course will introduce the core concepts of operating systems, such as process and threads, scheduling, synchronization, memory management, file systems and security for standalone operating systems. The course concludes with an introduction to the design of distributed operating systems.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Type		Mode of Delivery			
			L	T	C&T	PPT	VL/VC	DEMO
1	1	Operating Systems – Definition-Types - Functions - Abstract view of OS	√		√	√		
2	2	System Structures –System Calls- Virtual Machines	√		√	√		
3	3	Process Concepts -Threads - Multithreading	√		√	√		
4	4	Process Scheduling	√	√	√	√		
5	5	Process Co-ordination-Synchronization	√		√	√		
6	6	Semaphores -Monitors – Hardware Synchronization	√	√	√	√		
7	7	Deadlocks - Methods for Handling Deadlocks	√		√	√		
8	8	Memory Management Strategies - Contiguous and Non-Contiguous allocation	√	√	√	√		
9	9							
10	10	Virtual memory Management – Demand Paging - Page Placement and Replacement Policies	√	√	√	√		
11	11	File System – Basic concepts - File System design and Implementation	√		√	√		
12	12	Case Study: Linux File Systems	√		√	√		
13	13	Mass Storage Structure –Disk Scheduling –Disk Management – I/O Systems - System Protection and Security.	√	√	√	√		

14	14	Distributed Systems –Distributed operating systems	√		√	√		
15	15	Distributed file systems	√		√	√		
16	16	Distributed Synchronization.	√		√	√		

ESSENTIAL READINGS

Text Book

1. Silberschatz, Galvin, Gagne, "Operating System Concepts", John Wiley and Sons, 9/E 2013

References Books

1. William Stallings, "Operating Systems – Internals and Design Principles", 8/E, Pearson Publications, 2014
2. Andrew S. Tanenbaum, "Modern Operating Systems", 4/E, Pearson Publications, 2014
3. Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau, "Operating Systems: Three Easy Pieces", Version 0.91, freely downloadable from http://pages.cs.wisc.edu/~remzi/OSTEP/

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week	Duration	% Weightage
1	Cycle Test - 1	5th week	1 Hour	20
2	Compensation Assessment- 1	6Th week	1 Hour	20
3	Cycle Test - 2	10th week	1 Hour	20
4	Compensation Assessment- 2	11th week	1 Hour	20
5	Assignments- I & II	4th & 10th weeks	–	10
6	End Semester Examination	15th week	3 Hours	50
			Total	100

COURSE EXIT SURVEY

1. Students' feedback through class committee meetings
2. Feedback questionnaire collected from students through MIS before end semester examination

COURSE POLICY

1. All the students are expected to attend all the contact hours. Anyhow students who fall short of 75% attendance to the contact hours are not eligible to appear for the final written examination.
2. For valid reasons, students who fall on 50-75% attendance range have to attend a compensatory examination and have to attain more than 50%. Those who have secured less than 50% are not eligible to appear for the final written examination.
3. If a student is found using mobile phones or any other gadgets during the tests/ exams, the answer sheet of the student will not be evaluated and he/ she will be awarded ZERO marks for that test/ exam.
4. Compensation assessments will only be conducted for those students who were not able to attend the regular tests in Sl. Nos. 1 and 3 under the heading 'COURSE ASSESSMENT METHODS', on emergency requirements (medical, death of a close friend/ relative, etc.) and for representing institute-level events.
5. The Course Coordinator is available for consultation during the time intimated to the students then and there.

FOR APPROVAL

Course Faculty
(Dr. S. JAYA NIRMALA)

Class Committee Chairperson

HoD/ CSE
(Dr. R. LEELA VELUSAMY)