NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PLAN – PART I				
Name of the programme and specialization	**B.Tech. Computer Science and Engineering**			
Course Title	**Operating Systems**			
Course Code	**CSMI13**		**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**Nil**			
Session	**January 2023**		**Section (if, applicable)**	**VI Semester**
Name of Faculty	**Dr. M. Brindha**		**Department**	**CSE**
Email	brindham@nitt.edu		**Telephone No.**	9944627902
Name of Course Coordinator(s) (if, applicable)	NA			
E-mail		**Tele phone No.**		
Course Type	**Elective Course**			

Syllabus (approved in Senate)

Unit – I

Basic OS Concepts -User's view of the OS -Architectural support –System Calls-Thread and process scheduling -Pre-emptive and non-pre-emptive-FCFS, SJF, Round Robin, Multilevel Queue.

Unit –II

Inter process synchronization, Mutual exclusion algorithms, Hardware support, Semaphores, Concurrent programming using semaphores.

Unit –III

Inter process communication, Deadlocks: Characterization, Prevention, Avoidance, detection and recovery, combined approach to deadlock handling.

Unit –IV

Contiguous allocation, Static and dynamic partitioned memory allocation, Segmentation, Non-contiguous allocation, Paging, Hardware support, Virtual Memory, Demand Paging.

Unit –V

Need for files, File abstraction, File naming, File system organization, File system optimization, Reliability, Security and protection, I/O management and disk scheduling, Recent trends and developments

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
Ability to comprehend the techniques used to implement the process manager	1, 3, 5
Ability to comprehend virtual memory abstractions in operating systems	3
Ability to design and develop file system interfaces	1, 2, 3,4, 5

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	Mode of Delivery
1.	I Week	Basic OS Concepts -User's view of the OS - Architectural support	PPT/Chalk
2.	II Week	System Calls-Thread and process scheduling -Pre-emptive and non-pre-emptive scheduling	PPT/Chalk
3.	III Week	FCFS, SJF, Round Robin, Multilevel Queue.	PPT/Chalk
4.	IV Week	Inter process synchronization, Mutual exclusion algorithms	PPT/Chalk
5.	V Week	Hardware support, Semaphores	PPT/Chalk
6.	VI Week	Concurrent programming using semaphores.	PPT/Chalk
7.	VII Week	Inter process communication	PPT/Chalk
8.	VIII Week	Deadlocks: Characterization, Prevention, Avoidance	PPT/Chalk
9.	IX Week	Deadlock detection and recovery, Combined approach to deadlock handling	PPT/Chalk
10.	X Week	Contiguous allocation, Static and dynamic partitioned memory allocation	PPT/Chalk

11.	XI Week	Segmentation, Non-contiguous allocation, Paging	PPT/Chalk
12.	XII Week	Hardware support, Virtual Memory, Demand Paging. Need for files, File abstraction	PPT/Chalk
13.	XIII Week	File system organization, File system optimization	PPT/Chalk
14.	XIV Week	Security and protection, I/O management and disk scheduling, Recent trends and developments	PPT/Chalk

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/

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	CT-1	As per Dean (Academic) Schedule	1Hour	20%
2.	CT2	As per Dean (Academic) Schedule	1Hour	20%
3.	Assignment	After CT1	Non-contact Hours	20%
CPA	Compensation Assessment*	As per Dean (Academic) Schedule	1Hour	20%
4.	Final Assessment*	As per Dean (Academic) Schedule	3 hours	40%
TOTAL				**100%**

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

1. Students’ feedback through class committee meetings.
2. Feedback questionnaire from students – from MIS at the end of the semester.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Mode of Correspondence through Phone, E mail.

COMPENSATION ASSESSMENT POLICY

If any student is not able to attend Assessment-1 and/or Assessment-2 due to genuine reasons, student is permitted to attend the compensation assessment (CPA) with 20% weightage.

ACADEMIC DISHONESTY & PLAGIARISM

- **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.
- The above policy against academic dishonesty shall be applicable for all the programmers.

ADDITIONAL INFORMATION

The students can get their doubts clarified at any time with their faculty member.

FOR APPROVAL

Course Faculty **CC-Chairperson** **HOD**