

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP)

Academic Year: 2026-27

K-1

Date: 15/06/2026

Institute Name & Code: K. K. Wagh Polytechnic, Nashik (0078)

Programme and Code: Artificial Intelligence & Machine Learning (AN)

Course Index: 501

Course Name: Operating System

Class: TYAN

Course Abbr. & Code: OSY-315319

Semester: Vth Scheme: 'K'

Allocated Hrs: 50

Name of Faculty: Mrs. R. Y. Thombare

Teaching-Learning and Assessment Scheme:

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Assessment Scheme												
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TL				Based on SL		Total Marks	
															Practical							
				CL	TL	LL					FA-TH	SA-TH	Total	FA-PR		SA-PR		SLA				
							Max	Min						Max	Min	Max	Min					
315319	Operating System	OSY	DSC	5	-	2	2	9	3	3	30	70	100	40	25	10	25@	10	25	10	175	

Total IKS Hrs for Sem. : 00 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment SLA - Self Learning Assessment, Self-learning includes micro project / assignment / other activities

Course Outcomes:

CO501.1: Explain the services and components of an Operating System.

CO501.2: Describe the different aspects of Process Management in an Operating System.

CO501.3: Implement various CPU Scheduling algorithms and evaluate their effectiveness.

CO501.4: Analyse the Memory Management techniques used by an Operating System.

CO501.5: Apply techniques for effective File Management in an Operating System.

Course Outcomes (COs) & Theory Learning Outcomes (TLOs):

By learning the course Operating System (OSY-315319) Third year AIML students will be able to:

CO No.	TLO No.	Course Outcomes (COs) / Theory Learning Outcomes (TLOs)
CO501.1		Explain the services and components of an Operating System.
	TLO 1.1	Describe functions of an Operating System.
	TLO 1.2	Explain different services of Operating System.
	TLO 1.3	Explain use of system call of Operating System.
	TLO 1.4	Explain activities of Operating System in concern with their components.
CO501.2		Describe the different aspects of Process Management in an Operating System.
	TLO 2.1	Explain the different states of a process.
	TLO 2.2	Describe the functions of different component of process stack in Process Control Block
	TLO 2.3	Explain multiple processes access shared resources without interfering each other.
	TLO 2.4	Compare Multithreading models.
CO501.3		Implement various CPU Scheduling algorithms and evaluate their effectiveness.
	TLO 3.1	Justify the need of given scheduling criteria with relevant example.
	TLO 3.2	Explain with example the procedure of allocating CPU to the given process.

	TLO 3.3	Calculate turnaround time and average waiting time of the given scheduling algorithm.
	TLO 3.4	Explain functioning of the given necessary conditions leading to Deadlock.
CO501.4	Analyze the Memory Management techniques used by an Operating System.	
	TLO 4.1	Compare fixed and variable memory partitioning.
	TLO 4.2	Differentiate between Bit map and Linked list technique.
	TLO 4.3	Explain working of various partitioning algorithm.
	TLO 4.4	Calculate page fault for given page reference string.
CO501.5	Apply techniques for effective File Management in an Operating System	
	TLO 5.1	Explain structure of the given file system with example.
	TLO 5.2	Describe mechanism of file access method.
	TLO 5.3	Explain procedure to create access directories and assign the given file access permissions.

● **Teaching Plan:**

Unit No. (Allott ed Hrs.)	TLO	Title/Topic Details and mapped Course Outcomes [CO]	Plan (From -To & No. of Lectures)	Actual Execution (From-To & No. of Lectures)	Teaching Methods/ Media/ Tools used	Remark
01		Operating System services & components [CO501.1]				
10 Hrs 14M	1.1	1.1 Operating System: concept, functions 1.2 Different types of Operating System: Batch Operating System, Multi-programmed, Time Shared Operating System, Multiprocessor System, Distributed System, Real Time System, Mobile OS (Android OS)	18/08/2026 to 20/08/2026 (04)		Chalk board, LCD Projector + PPT Notes MKCL ERA Quiz	
	1.1	1.3 Command line based Operating System: DOS, UNIX GUI based Operating System: WINDOWS, LINUX, MaC OS	21/08/2026 (01)			
	1.2 1.3	1.4 Different Services of Operating System, System Calls: Concept, types of system calls	25/08/2026 to 28/08/2026 (03)			
	1.4	1.5 Operating System Components: Process Management, Main Memory Management, File Management, IO Management, Secondary Storage Management. BS*:Storage Structure in Operating System	28/08/2026 01/09/2026 (02)			
02		Process Management [CO501.2]				
10 Hrs 14M	2.1	2.1 Processes: process state, process control block (PCB)	02/09/2026 (01)		Chalk board, LCD Projector + PPT Notes, MKCL ERA Quiz, YouTube Videos	
	2.2	2.2 Process Scheduling: scheduling queues, types of schedulers, context switch	03/09/2026 to 04/09/2026 (03)			
	2.3	2.3 Inter Process Communication: Shared memory system, Message passing system	04/09/2026 to 08/09/2026 (02)			
	2.4	2.4 Threads: Benefits, User and Kernel level threads, Multithreading Models: One to One, Many to One, and Many to Many	09/09/2026 to 10/09/2026 (03)			

	2.1	2.5 Execute process commands like: top, ps, kill, wait, sleep, exit, nice	11/08/2026 (01)			
03		CPU Scheduling [CO501.3]				
10 Hrs 16M	3.1	3.1 Scheduling: Basic concept, CPU and I/O burst cycle 3.2 Preemptive and Non-preemptive scheduling, scheduling criteria	08/08/2026 (02)		Chalk board, LCD Projector + PPT Notes, MKCL ERA Quiz, YouTube Videos	
	3.2 3.3	3.3 + First Come First Serve (FCFS), Shortest Job First (SJF), Shortest Remaining Time Next (SRTN), Round Robin (RR), Priority Scheduling, Multilevel Queue Scheduling	15/09/2026 to 18/09/2026 (05)			
	3.4	3.4 Deadlock: System Models, Necessary conditions leading to Deadlock, Deadlock Handling: Deadlock prevention, Deadlock avoidance- Banker's Algorithm	18/09/2026 to 23/09/2026 (03)			
04		Memory Management [CO501.4]				
12 Hrs 16M	4.1	4.1 Basic Memory Management: Partitioning - Fixed and Variable, 4.2 Swapping, Compaction, Fragmentation, Partitioning Algorithms: First fit, Best fit, Worst fit	24/09/2026 to 25/09/2026 (03)		Chalk-board, LCD Projector + PPT Notes, MKCL ERA Quiz, YouTube Videos	
	4.2	Free Space Management Techniques: Bit map, Linked List & Index	29/09/2026 30/09/2026 (02)			
	4.3	4.3 Non-contiguous Memory Management Techniques: Paging, Segmentation	01/10/2026 (02)			
	4.3 4.4	4.4 Virtual Memory: Basics, Demand paging, Page Fault	06/10/2026 07/10/2026 (02)			
	4.4	4.5 Page Replacement Algorithm: First In First Out (FIFO), Least Recently Used (LRU), Optimal	08/10/2026 to 09/10/2026 (03)			
05		File Management [CO501.5]				
08 Hrs 10M	5.1	5.1 File Concepts: Attributes, Operations, File types and File system structure	13/10/2026 (02)		Chalk board, LCD Projector + PPT Notes, MKCL ERA Quiz	
	5.1	5.2 Accessing Methods: Sequential, Direct & Indexed access	14/10/2026 (02)			
	5.2	5.3 File Allocation Methods: Contiguous allocation, Linked allocation, Indexed Allocation	15/10/2026 (02)			
	5.3	5.4 Directory Structure: Single level, Two level, Tree structured Directory	16/10/2026 to 17/10/2026 (02)			
50 Hrs 70M		Revision and Discussion on MSBTE Q. Papers	17/10/2026			

BS* : Beyond Syllabus Topic

• **COs-POs & PSOs Matrix:**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2
CO1	2	-	-	2	-	-	1	3	2
CO2	1	-	-	2	1	-	-	3	3
CO3	1	1	1	2	-	-	-	3	3
CO4	2	2	2	2	1	-	2	3	3
CO5	2	2	2	2	1	-	2	3	3

Legends :- High:03, Medium:02,Low:01, No Mapping: -

- PSO1: Apply fundamental concepts of Computer Engineering and Artificial Intelligence and machine learning to solve technical problems.
- PSO2: Implement the domain knowledge to achieve successful career as an engineering professional.

• **Theory Assessment Criteria:**

A. Theory Assessment (FA-TH & SA-TH):

1. Total Theory weightage for this Course is 100 Marks.
2. Out of 100 Marks, 70 Marks are allotted to MSBTE Theory Examination (SA-TH).
3. Two class tests of 30 marks each conducted during the semester. Average of two class tests, 30 marks are allotted under the head FA-TH.

B. Self-Learning Activity (SLA) Assessment:

1. One Self Learning Activity of 25 Marks are allotted to a group of 2 to 4 students.
2. The activity may be micro project, assignments, report writing or operating system related online courses on MOOCS such as NPTEL, Coursera, Infosys Springboard etc.

• **References:**

A. Books:

Sr. No.	Author	Title	Publisher
1.	Dhananjay M. Dhamdhare	Operating System: A Concept- Based Approach	McGraw Hill Education 3rd edition, ISBN: 978-1259005589
2.	William Stallings	Operating Systems : Internals and Design Principles	Pearson Education 9th Edition, ISBN: 978-9352866717
3.	Richard Petersen	Linux The Complete Reference	McGraw Hill, 6th edition, ISBN: 978- 0071492478
4.	Richard Blum	Linux command line and shell scripting	Wiley India, ISBN: 978-1118983843
5.	Abraham Silberschatz and James Peterson	Operating System Concepts	Wiley India, ISBN: 9781119454083

B. Web Sites:

Sr. No	Link / Portal	Description
1	https://archive.nptel.ac.in/courses/106/105/106105214/	Introduction to Operating System
2	https://www.geeksforgeeks.org/processes-in-linuxunix/	Process Related commands

3	https://ubuntu.com/download/desktop	Installation of Ubuntu
4	https://developers.redhat.com/products/rhel/download	RedHat Linux download
5	https://www.digitalocean.com/community/tutorials/linux-commands	Basic Linux commands
6	https://www.geeksforgeeks.org/what-is-an-operating-system/	Operating System

C. Tools:

1. Google Classroom, Power Point, MKCL Learn Live LMS.

D. URLs of Referred Videos:

Sr. No.	Topic Name	Link
1.	Introduction to Operating Systems	https://www.youtube.com/watch?v=vBURTt97EkA&list=PLBlnK6fEyqRiVhbXDGLXDk_OQAeuVcp2O
2.	Introduction to OS (NPTEL Course)	https://www.youtube.com/watch?v=jciGIvn7UfM&list=PL3-wYxht4yCjpcfUDz-TgD_ainZ2K3MUZ
3.	Unix System Calls	https://www.youtube.com/watch?v=z3Nw5o9dS7Q&list=PLsylUObW5M3CAGT6OdubyH6FztKfJCcFB
4.	Types of OS	https://www.youtube.com/watch?v=povNcHSasgs&list=PLxCzCOWd7aiGz9donHRrE9I3Mwn6XdP8p&index=3
5.	OS Lectures Play List	https://youtube.com/playlist?list=PLdo5W4Nhv31a5ucW_S1K3-x6ztBRD-PNa&si=u1weKXvZfBoQm8nK
6.	Memory Management Techniques: Paging, Segmentation	https://www.youtube.com/watch?v=6c-mOFZwP_8
7.	File Accessing Methods: Sequential, Direct & Indexed access	https://www.youtube.com/watch?v=QhWwMW6YHzc&t=16s
8.	Virtual Memory: Basics, Demand paging, Page Fault	https://www.youtube.com/watch?v=o2_iCzS9-ZQ
9.	Types of Scheduling algorithms	https://www.youtube.com/watch?v=zFnRUVqtiOY

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Cc: Course File – OSY (315319)