

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

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

Course Index: 501

Course Name: Operating System

Course Abbr. Code: OSY-315319

Semester: Vth **Scheme:** K **Allocated Hrs:** 20

Name of Faculty: Mrs. R. Y. Thombare

Class: TYAN

• 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	
				CL	TL	LL					Practical				on SL							
											FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA			
											Max	Max	Max	Min	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 Objectives:

1. Learn various milestones in the history of Operating System and modern trends in Operating System.
2. Understand component of Operating System and use of system calls and tools.
3. Understand concept of process, Process Control Block Inter-process communication & Context switching
4. Learn about scheduler and implement various scheduling algorithms & deadlock.
5. Describe various memory management techniques.
6. Study various File management techniques

• 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.

• Laboratory Plan:

Sr. No.	CO	LLO	Name of Practical	Planned Date		Actual Date	Remark/ Assessment Date with Staff sign
				From	To		
1*	CO501	LLO 1.1	Linux Basic Commands such as cat, input output redirection, pipe operators, chmod Coomand.	A-18/08/2026 B-19/08/2026 C-20/08/2026	A-18/08/2026 B-19/08/2026 C-20/08/2026		
1.	CO501.1 CO501.2	LLO 1.1	* System call commands in Linux such as fork(), exec(),	A-18/08/2026 B-19/08/2026	A-25/08/2026 B-26/08/2026		

			getpid, pipe, exit, open, close, stat, uname.	C-20/08/2026	C-27/08/2026		
2.	CO501.2	LLO 1.2	* Process related commands in Linux - top, ps, kill, wait, sleep, nice, renice, bg, fg.	A-25/08/2026 B-26/08/2026 C-27/08/2026	A-1/09/2026 B-2/09/2026 C-3/09/2026		
3.	CO501.1 CO501.4	LLO 1.3	* a. Commands for Sending Messages to Logged-in Users -who, cat, wall, write, mesg. * b. List Processes Attached to a Shared Memory Segment: ipcs.	A-18/08/2026 B-19/08/2026 C-20/08/2026	A-25/08/2026 B-26/08/2026 C-27/08/2026		
4.	CO501.1 CO501.3	LLO 1.4	* Write a C/Python program to calculate average waiting time and Turnaround Time of n processes with First Come First Serve (FCFS) CPU scheduling algorithm.	A-1/09/2026 B-2/09/2026 C-3/09/2026	A-8/09/2026 B-9/09/2026 C-10/09/2026		
5.	CO501.1 CO501.3	LLO 1.5	Write a C/Python program to calculate average waiting time and Turnaround Time of n processes with Shortest Job First (SJF) CPU scheduling algorithm.	A-8/09/2026 B-9/09/2026 C-10/09/2026	A-15/09/2026 B-16/09/2026 C-17/09/2026		
6.	CO501.1 CO501.4	LLO 1.6	Write a C/Python program to calculate average waiting time and Turnaround Time of n processes with Priority CPU scheduling algorithm.	A-15/09/2026 B-16/09/2026 C-17/09/2026	A-22/09/2026 B-23/09/2026 C-24/09/2026		
7.	CO501.1 CO501.4	LLO 1.9	Basic memory management commands-df,,free, vmstat,, htop.	A-22/09/2026 B-23/09/2026 C-24/09/2026	A-29/09/2026 B-30/09/2026 C-1/10/2026		
8.	CO501.1 CO501.4	LLO 1.10	* Write a C/Python program on First In First Out (FIFO) Page Replacement algorithm.	A-22/09/2026 B-23/09/2026 C-24/09/2026	A-29/09/2026 B-30/09/2026 C-1/10/2026		
9.	CO501.1 CO501.4	LLO 1.11	Write a C/Python program on Least Recently Used (LRU) Page Replacement algorithm.	A-29/09/2026 B-30/09/2026 C-1/10/2026	A-6/10/2026 B-7/10/2026 C-8/10/2026		
10.	CO501.1 CO501.5	LLO 1.12	* Write a C/Python program on sequential file allocation method.	A-6/10/2026 B-7/10/2026 C-8/10/2026	A-13/10/2026 B-14/10/2026 C-15/10/2026		

● **Direct Assessment Criteria:(Practical)**

Sr. No.	Weightage- Process related (Marks-10)	40%
1.	Logic Formation	20%
2.	Debugging Ability	10%
3.	Follow Ethical Practices:	10%
	Weightage- Product related (Marks-15)	60%
4.	Expected Output	25%

5	Timely Submission	25%
6.	Answer to Sample questions	10%
	Total (25 Marks)	100%

● **Rules for Formative Assessment:**

- Formative assessment of each practical is based on Process related (10 marks) and Product related (15 marks) - Total out of 25 marks as per the assessment scheme prescribed in manual given by MSBTE,
- The Performance Indicators of each practical is assessed according to product and process related skills. (Sample format is as given in above table). Final assessment of 125 Marks for all practicals.

Following is the distribution of 25 Marks –

- Summative Assessment (SA-PR) for 25 Marks will be conducted by MSBTE after the completion of the term.
 - Formative assessment (FA-PR) will carry 50 Marks
 - Self learning assessment(SLA) will carry 25 Marks
- Final FormativeAssessment (F.A.) of 50 marks is calculated as follows:

$$FA\ Marks = ((Total\ obtained\ marks)*50)/ (50*Total\ Number\ of\ parcticals)$$
 - A comprehensive Final Practical End Semester examination(SA-PR of 50 Marks) will be conducted by MSBTE at the end of semester. Examiner for this examination will be External examiner. The schedule of MSBTE

Practical Examination will be display on Notice board prior to examination.

● **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://vwww.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 for practical Conduction:**

- 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=vBURt97EkA&list=PLBlnK6fEyqRiVhbXDGLXDk_OQAeuVcp2O

2.	Introduction to OS (NPTEL Course)	https://www.youtube.com/watch?v=jciGIvn7UfM&list=PL3-wYxbt4yCjpcfUDz-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)