

# GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Computer Science and Engineering

Academic Year: **2016-17**

Semester: **EVEN**

## COURSE PLAN

Semester: **VI**

Subject Code& Name: **10CS62 &Unix System Programming**

Name of Subject Teacher: **APARNA N**

Name of Subject Expert (Reviewer): **ARVIND R**

For the Period: From: 13-02-17

Details of Book to be referred:

Text Books	T1. Terrance Chan: UNIX System Programming Using C++, Prentice Hall India, 1999. T2. W. Richard Stevens: Advanced Programming in the UNIX Environment, 2 <sup>nd</sup> Edition, Pearson Education, 2005.
Reference Books	R1. Marc. J Rochkind: Advanced UNIX Programming, 2 <sup>nd</sup> Edition, Pearson Education, 2005. R2. Maurice J Bach: The Design of the UNIX Operating System, Pearson Education, 1987.

Lecture NO	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	<b>Introduction to the subject</b>	Introduction to all the units in brief.		13-02-17				
2.	<b>UNIT-1- Introduction:</b> The ANSI C Standard. The ANSI/ISO C++ Standards: Difference between ANSI C and C++	<b>Objective:</b> Understand the ANSI and POSIX	T1: 2-7	15-02-17				

3.	The POSIX Standards: Subset of POSIX, POSIX Environment.	<p>standard, Different APIs of POSIX and the characteristics of each.</p> <p><b>Application:</b> This unit helps to understand different standards in UNIX and POSIX and to implementation of each of them in the program.</p> <p><b>Outcome:</b> Acquire knowledge of various standards that are applicable to UNIX system programmers.</p>	T1: 8-11	16-02-17					
4.	The POSIX Standards: POSIX Feature Test Macro.		T1: 11-13	20-02-17					
5.	The POSIX Standards: Limits Checking at Compile time and Runtime.		T1: 13-17	21-02-17					
6.	The POSIX.1 FIPS Standard, The X/Open Standards UNIX and POSIX APIs: The POSIX APIs.		T1: 18-19, T1: 125-126	22-02-17					
7.	The UNIX and POSIX Development Environment, API Common Characteristics.		T1: 126-128	22-02-17					
8.	Test/ Revision		T1: 2-9, 125-128	23-02-17					
9.	<b>UNIT-2- UNIX Files:</b> File Types: Regular Files, Directory Files, Device File.		<p><b>Objective:</b> Describe different file types in UNIX and POSIX. And the different file attributes.</p> <p><b>Application:</b> This unit helps to understand different types of Files and File system in UNIX. Usage of File Pointers and descriptors in program.</p>	T1: 129-131	23-02-17				
10.	File Types: FIFO File, Symbolic Link File. The UNIX and POSIX File System			T1: 132-133	27-02-17				
11.	The UNIX and POSIX File Attributes, Inodes in UNIX System V.	T1: 134-136		28-02-17					
12.	Application Program Interface to Files.	T1: 137-138		1-03-17					
13.	UNIX Kernel Support for Files.	T1: 139-141		1-03-17					

14.	Relationship of C Stream, Pointers and File Descriptors, Directory Files. Hard and Symbolic Links.	<b>Outcome:</b> Understand UNIX and POSIX file system and different types in the system. Also study how these files are created and used.	T1: 142-144	2-03-17				
15.	Test/Revision		T1: 129-144	2-03-17				
16.	<b>UNIT-3- UNIX File APIs:</b> General File APIs: Open(), Create(), Read(), Write()	<b>Objective:</b> Describe all the File APIs used in UNIX. Different file classes used with each file category. <b>Application:</b> This unit helps to understand categories of file classes and can be used in the program. <b>Outcome:</b> Acquire knowledge of UNIX and POSIX file APIs which are used to create, open, read, write and close all types of files in a system.	T1: 147-154	4-03-17				
17.	General File APIs: Close(), fcntl(), lseek(), link(), Unlink(),		T1: 155-161	6-03-17				
18.	General File APIs: stst, fstat, access, chmod, fchmod,		T1: 162-169	7-03-17				
19.	General File APIs: chown, fchown, lchown, utime function.		T1: 170-173	13-03-17				
20.	File and Record Locking, File APIs: Directory File APIs, Device File APIs.		T1: 173-184	14-03-17				
21.	File APIs: FIFO File APIs, Symbolic Link File APIs		T1: 185-190	15-03-17				
22.	General File Class, regfile Class for Regular Files		T1: 191-196	15-03-17				
23.	Dirfile class, FIFO File Class, Symbolic Link File Class		T1: 197-202	16-03-17				
24.	File Listing Program		T1: 203-204	16-03-17				
25.	Test/Revision		T1: 147-204	20-03-17				
26.	<b>UNIT-4 UNIX Processes:</b> The Environment of a UNIX Process: Introduction, The main function	<b>Objective:</b> Describe the environment of	T2: 179	21-03-17				

27.	Process Termination	<p>UNIX Process, Memory Layout of C program, Memory Allocation.</p> <p><b>Application:</b> Helps to allocate the memory efficiently by understanding the different functionalities.</p> <p><b>Outcome:</b> Understand the environment of a C program in a UNIX systems environment and the process control features of UNIX.</p>	T2: 180-184	22-03-17				
28.	Command-Line Arguments, Environment List.		T2: 185-186	23-03-17				
29.	Memory Layout of a C Program, Shared Libraries		T2: 186-189	27-03-17				
30.	Memory Allocation.		T2: 189-192	28-03-17				
31.	Environment Variables, setjmp and longjmp Functions		T2: 192-202	30-03-17				
32.	getrlimit, setrlimit Functions		T2: 202-206	30-03-17				
33.	UNIX Kernel Support for Processes.		T1: 208-210	3-04-17				
34.	<b>UNIT-5 Process Control:</b> Process Identifiers, fork,vfork.		T2: 209-217	4-04-17				
35.	exit, wait, waitpid, wait3, wait4 Functions		T2: 218-227	5-04-17				
36.	Race Conditions, exec Functions.		T2: 227-236	5-04-17				
37.	Changing User IDs and Group IDs, Interpreter Files.	T2: 237-245	6-04-17					
38.	System Function, Process Accounting	T2: 246-255	6-04-17					
39.	User Identification, Process Times	T2: 256-259	10-04-17					
40.	Process Relationships: Introduction, Terminal Logins, Network Logins.	T2: 261-268	11-04-17					
41.	Process Relationships: Process Groups, Sessions,	T2: 269-271	12-04-17					

42.	Controlling Terminal, tcgetpgrp and tcsetpgrp Functions, Job Control, Shell Execution of Programs.	groups of processes: sessions which are made up of process groups.	T2: 272-281	12-04-17				
43.	Orphaned Process Groups.		T2: 282-284	20-04-17				
44.	<b>UNIT-6 Signals and Daemon Processes:</b> Signals: The UNIX Kernel Support for Signals	<p><b>Objective:</b> Understand the Signal section used with the process. And to describe the daemon process also.</p> <p><b>Application:</b> Understanding of different signals will help to use this in program. And make implementation effective.</p> <p><b>Outcome:</b> Understand the signal handling methods in UNIX and POSIX.1 systems and various means where process could generate signals to other process or to itself.</p>	T1: 259-262	20-04-17				
45.	signal, Signal Mask		T1: 262-268	24-04-17				
46.	sigaction, The SIGCHLD Signal and the waitpid Function.		T1: 268-271	25-04-17				
47.	The sigsetjmp and siglongjmp Functions,		T1: 272-273	26-04-17				
48.	Kill, Alarm, Interval Timers		T1: 274-281	26-04-17				
49.	POSIX.1b Timers.		T1: 282-286	27-04-17				
50.	Daemon Processes: Introduction, Daemon Characteristics		T2: 423-425	27-04-17				
51.	Coding Rules, Error Logging.		T2: 425-432	2-05-17				
52.	Client-Server Model		T2: 439	3-05-17				
53.	Test/Revision		T1: 259-286 T2: 423-439	3-05-17				
54.	<b>UNIT-7 Interprocess Communication-1:</b> Overview of IPC Methods, Pipes	<p><b>Objective:</b> Provide an Overview of Interprocess communication. And the different communication</p>	T2: 495-502	4-05-17				
55.	popen, pclose Functions		T2: 503-509	4-05-17				

56.	Coprocesses, FIFOs	methodologies. <b>Application:</b> Apply knowledge in communicating different processes using FIFO, IPC, and Message Queue.	T2: 510-517	6-05-17				
57.	System V IPC	<b>Outcome:</b> Acquire knowledge of numerous forms of interprocess communication.	T2: 518-521	8-05-17				
58.	Message Queue		T2: 522-526	9-05-17				
59.	Semaphores.		T2: 527-532	10-05-17				
60.	<b>UNIT-8 Interprocess Communication-2: Shared Memory</b>		<b>Objective:</b> Provide an Overview of Interprocess communication Between Client-Server, shared memory and Pipes.	T2: 495-502	10-05-17			
61.	Client-Server Properties	<b>Application:</b> Able to use pipes and file descriptors for making the communication between different processes. Acquire knowledge of numerous forms of interprocess communication.	T2: 503-509	11-05-17				
62.	Stream Pipes		T2: 510-517	11-05-17				
63.	Passing File Descriptors		T2: 518-521	18-05-17				
64.	An Open Server-Version1, Client-Server Connection Functions.		T2: 522-526	18-05-17				
65.	Revision				22-05-17			
66.	Revision	Solving VTU			24-05-17			

67.	Revision	Question Papers		25-05-17				
68.	Revision			29-05-17				
69.	Revision			30-05-17				

Prepared By: \_\_\_\_\_  
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