Academic Course Description

BHARATH UNIVERSITY

Faculty of Engineering and Technology

Department of Electronics and communication Engineering

BCS008- DISTRIBUTED OPERATING SYSTEM

Seventh Semester, 2017-18 (odd Semester)

Course (catalog) description

- To provide hardware and software issues in modern distributed systems.
- To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
- To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed.

Compulsory/Elective course : Elective for ECE students

Credit & Contact hours : 3 & 45

Course Coordinator : Ms.C.Anuradha, Assistant Professor

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Ms.C.Anuradha	Final Year	SA 104			9.00-9.50 AM
Ms.Kavitha	Final Year	SA 103		Kavi789@yahoo.com	12.45-1.15 PM

Relationship to other courses:

Pre –requisites **:** Advanced Computer Architecture

Assumed knowledge : The students will have a electronics and network background obtained at a high school (or Equivalent) level. In particular, working knowledge of networks including Real time systems, embedded systems are assumed

Following courses : Electronics and instrumentation

UNIT- I **9**

Modes of communication, System Process, Interrupt Handling, Handling Systems calls, Protection of resources &Resources Management Micro-Kernel Operating System.

UNIT- II **9**

Review of Network Operating System and Distributed Operating System, Issue in the design of Distributed Operating System, Overview of Computer Networks. Inter process communication, Linux, IPC Mechanism, Remote Procedure calls, RPC exception handling, Security issues, RPC in Heterogeneous Environment (case study Linux RPC)

UNIT -III **9**

Clock Synchronization, Logical clocks, Physical clocks, clock synchronization algorithms, Mutual Exclusion, Election Algorithms, Dead locks in Distributed Systems. Thrashing, Heterogeneous DSM, Resource Management (Load Balancing approach, Load Sharing approach), Process Management: process Migration, Thread.

UNIT- IV **9**

Overview of shared memory, consistency model, Page based Distributed Shared Memory, Shared –variable Distributed Memory, Object -based Distributed Memory.

UNIT- V **9**

File models, File access, File sharing, file-caching, File Replication, fault Tolerance, Network File System, (Case study, 8NFS on Linux Directory Services, Security in Distributed File system).

TOTAL NO OF PERIODS: 45

TEXT BOOKS:

1. M. Beck et al," Linux Kernel Programming",3rd edition, 2002.
2. B.W. Kernighan and R Pide, "The Unix Programming Environment ", Prentice Hall of India-2000.

REFERENCES:

1. Silberschatz,P.B.Garvin,Gagne," Operating System Concepts", 2009.
2. https://www.cs.columbia.edu/~smb/classes/s06-4118/l26.pdf

Computer usage: Nil

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area : Instrumentation | Electronics | Transmission Lines and Networks | Biomedical

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 1st week	Session 1 to 12	2 Periods
2	Cycle Test-2	March 2nd week	Session 17 to 25	2 Periods
3	Model Test	April 2nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To develop problem solving skills and understanding of circuit theory through the application of techniques and principles of electrical circuit analysis to common circuit problems. This course emphasizes:	Correlates to program outcome		
	H	**M**	**L**
To provide hardware and software issues in modern distributed systems.	c,l	a	
To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.	b,c,l	d	
To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed.	c,l	b	a
To know about Shared Memory Techniques.	d	b,c	
Have Sufficient knowledge about file access.	c	a,b,d	

H: high correlation, M: medium correlation, L: low correlation

Draft lecture schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I	**MODES**		
1.	Modes of communication, System Process	No	[T1]
2.	Interrupt Handling	No	
3.	Handling Systems calls	No	
4.	Protection of resources	No	
5.	Resources Management	No	
6.	Micro-Kernel Operating System	No	
UNIT II	**NETWORK OPERATING SYSTEM**		
7.	Review of Network Operating System and Distributed Operating System	No	[T1]
8.	Issue in the design of Distributed Operating System	No	
9.	Overview of Computer Networks. Inter process communication	No	
10.	Linux, IPC Mechanism, Remote Procedure calls	No	
11.	RPC exception handling, Security issues	No	
12.	RPC in Heterogeneous Environment (case study Linux RPC)	No	
UNIT III	**SYNCHRONIZATION**		
13.	Clock Synchronization, Logical clocks, Physical clocks	No	[T1]
14.	clock synchronization algorithms, Mutual Exclusion	No	
15.	Election Algorithms, Dead locks in Distributed Systems.	No	
16.	Thrashing, Heterogeneous DSM, Resource Management	No	
17.	Load Balancing approach, Load Sharing approach	No	
18.	Process Management: process Migration, Thread.	No	
UNIT IV	**SHARED MEMORY**		
19.	Overview of shared memory,	No	[T1]
20.	consistency model	No	
21.	Page based Distributed Shared Memory	No	
22.	Shared –variable Distributed Memory	No	
23.	Object -based Distributed Memory	No	
UNIT V	**OTHER TRANSDUCERS**		
24.	File models, File access	No	[T1]
25.	File sharing	No	
26.	file-caching, File Replication	No	
27.	fault Tolerance, Network File System	No	
28.	Case study, 8NFS on Linux Directory Services	No	

29.	Security in Distributed File system	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures

- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.

- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.

- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment /Seminar/online test/quiz	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by: Ms C.Anuradha, Assistant professor . **Dated :**

Addendum

ABET Outcomes expected of graduates of B.Tech / ECE / program by the time that they graduate*:*

a. An ability to apply knowledge of mathematics, science, and engineering

b. An ability to design and conduct experiments, as well as to analyze and interpret data

c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d. An ability to function on multidisciplinary teams

e. An ability to identify, formulate, and solve engineering problems

f. An understanding of professional and ethical responsibility

g. An ability to communicate effectively

h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i. A recognition of the need for, and an ability to engage in life-long learning

j. A knowledge of contemporary issues

k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives

PEO1: PREPARATION

Electronics Engineering graduates are provided with a strong foundation to passionately apply the fundamental principles of mathematics, science, and engineering knowledge to solve technical problems and also to combine fundamental knowledge of engineering principles with modern techniques to solve realistic, unstructured problems that arise in the field of Engineering and non-engineering efficiently and cost effectively.

PEO2: CORE COMPETENCE

Electronics engineering graduates have proficiency to enhance the skills and experience to apply their engineering knowledge, critical thinking and problem solving abilities in professional engineering practice for a wide variety of technical applications, including the design and usage of modern tools for improvement in the field of Electronics and Communication Engineering.

PEO3: PROFESSIONALISM

Electronics Engineering Graduates will be expected to pursue life-long learning by successfully participating in post graduate or any other professional program for continuous improvement which is a requisite for a successful engineer to become a leader in the work force or educational sector.

PEO4: SKILL

Electronics Engineering Graduates will become skilled in soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, interpersonal relationship, group discussion and leadership ability to become a better professional.

PEO5: ETHICS

Electronics Engineering Graduates are morally boosted to make decisions that are ethical, safe and environmentally-responsible and also to innovate continuously for societal improvement.

Course Teacher	Signature
Ms.C.Anuradha	

Course Coordinator **HOD/ECE**