

**EMBRY-RIDDLE AERONAUTICAL UNIVERSITY**  
**Department of Computing and Mathematics**  
**COURSE OUTLINE FOR**

**Course No.:** CS420  
**Cr Hrs:** 3

**Title:** Operating Systems

**Lecture Hours:** 3

**Laboratory Hours:** 0

**COURSE DESCRIPTION:**

The course will cover the basic concepts, theories and implementation of operating systems. Topics to be covered include an overview of basic computing hardware components, operating system structures, process management, memory management, file systems, input/output systems, protection and security. The Windows NT and UNIX operating systems will be reviewed as implementation examples. Prerequisite: CS315

**GOALS:**

The purpose of this course is two-fold: first, to give the student an understanding of the concepts and design of operating systems; and second, to examine the actual implementation of the UNIX and Windows NT operating systems in some detail.

**PERFORMANCE OBJECTIVES:**

1. Describe the functions of an operating system.
2. Describe the events that follow the occurrence of an interrupt.
3. Describe and assess various CPU scheduling algorithms.
4. Describe and assess various process and thread management schemes.
5. Describe and assess various real and virtual memory management schemes.
6. Use semaphores and other mechanisms to solve standard concurrency problems.
7. Describe and assess various file system designs
8. Describe operating system design considerations.
9. Write simple C language programs which employ operating system services.

**Department of Computing and Mathematics**  
**COURSE OUTLINE FOR CS420, Continued**

**TEXTBOOK:**

Silberschatz, A. and Galvin, P.B. (1998) *Operating System Concepts*. Addison Wesley Publishing Co., New York. (Fifth Edition) ISBN 0-201-59113-8

Nutt, G. (1999) *Operating System Projects Using Windows NT*. Addison Wesley Publishing Co., New York. ISBN 0-201-47708-4

**SUGGESTED SUPPLEMENTAL MATERIALS:**

Winston, P.H. (1994) *On To C*. Addison Wesley Publishing Co., New York. ISBN 0-201-58042-X

**PREREQUISITE KNOWLEDGE BY TOPIC:**

1. C language programming.
2. Data structures.

	<b>TOPIC</b>	<b>CLASS HOURS</b>	<b>COURSE OBJECTIVES</b>
1.	Overview of an Operating System	3	Describe the functions of an operating system.
2.	Computing Hardware Overview	2	Describe the functions of an operating system. Describe the events that follow the occurrence of an interrupt.
3.	Process Management	4	Describe and assess various process and thread management schemes.
4.	CPU Scheduling	3	Describe and assess various CPU scheduling algorithms
5.	Deadlocks and Synchronization	5	Use semaphores and other mechanisms to solve standard concurrency problems.
6.	Memory Management	5	Describe and assess various real and virtual memory management schemes.
7.	File systems and storage	4	Describe and assess various file system designs
8.	Protection	3	Describe and assess O/S protection mechanisms.

**LABORATORY:**

No closed laboratory sessions. Open laboratories used for homework assignments.

**COMPUTER USAGE:**

The chief resource is a laboratory of Windows NT Workstations.

**GRADING SYSTEM:**

Varies by instructor

**ESTIMATED CONTENT:**

<b>Skills:</b>	<b>20%</b>
<b>Content:</b>	<b>80%</b>