

Course Outline

1. Document Information

Degree Program	Computer Science
Course Number	CS 514
Course Title	Advanced Operating Systems
Semester Hours	3
Course Coordinator	Bidyut Gupta
Revision Term	Fall 2020
Latest Revision	Spring 2021

2. Catalog Description

Rigorous treatment of advanced topics in operating systems. Multiprocessor and distributed operating systems. Highly concurrent machines. Performance analysis of memory management and scheduling algorithms. Recovery techniques in distributed computation. Security in operating systems.

3. Textbooks

- No book Required.

4. References

5. Course Learning Outcomes

- Performance analysis of different algorithms used to design various components of operating systems
- To introduce more advanced concepts like distributed and network OS
- To prepare the student for further specialized study in any specific area of operating systems

6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6	7
Assessed		X	X	X	X		X

7. Prerequisites by Topic

CS 335 with a grade of C or better.

8. Major Topics Covered in the Course

1. Concurrent processes
Mutual exclusion, synchronization
2. Processor scheduling
Multiprocessor systems, tree-structured precedence graphs, list scheduling, preemptive and non-preemptive scheduling.
3. Storage allocation in paging systems
Optimal paging, working set, stack algorithms, extension problems.
4. Distributed operating systems
Mutual exclusion, deadlock
5. Case study Fault tolerance in distributed computing environment (including mobile computing environment)
6. Parallel compilers
7. Future directions of parallel and distributed computing systems.