

<b>Course name</b>	<b>ECE 40800 Operating Systems and System Programming</b>
<b>Credit and contact hours</b>	(3 cr.) Class 3
<b>Course coordinator's name</b>	Dongsoo S. Kim
<b>Textbook</b>	Silberscharz, Galvin, Gagne, <i>Operating System Concepts</i> , 9 <sup>th</sup> Ed., Wiley 2012 ISBN: 9781119800361
<b>Course information</b>	<p>ECE 40800 Operating Systems and System Programming (3 cr.)  P: ECE 36200, and CSCI 36200 or ECE 35900. Class 3. Students will learn to design and construct operating systems for both individual computers and distributed systems, and to apply and utilize operating system functionality to their application development. The course will cover basic concepts and methods for managing processor, main memory, storage, and network resources, including their system functions. Detailed examples are taken from a number of operating systems, emphasizing the techniques used in Linux/Unix operating system.</p> <p><b>Prerequisites/ Co-Requisite</b>  P: ECE 36200, and CSCI 36200 or ECE 35900</p> <p><b>Required, Elective, or Selected Elective:</b>  EE Elective, CE Required</p>
<b>Goals for the course</b>	<p>Upon successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> <li>1. Understand basic concepts of processes, process control, synchronization, scheduling. [1]</li> <li>2. Understand the concepts and technologies in memory management, secondary and tertiary storage management, file systems, networked or embedded operating systems. [1, 4, 2,6]</li> <li>3. Apply system functions of operating systems to the software design [1]</li> <li>4. Design and modify components of an operating system. [1, 6, 2]</li> </ol>
<b>List of topics to be covered</b>	<ol style="list-style-type: none"> <li>1. Process control in operating systems (1.5 classes)</li> <li>2. Multiprogramming (1 classes)</li> <li>3. Execution time and privilege (0.5 classes)</li> <li>4. Races, deadlocks, and starvation (1.5 classes)</li> <li>5. Process scheduling (2.5 classes)</li> <li>6. Input/Output control (0.5 classes)</li> <li>7. Interprocess communication (2 classes)</li> <li>8. Thread execution model (1 classes)</li> <li>9. System design model for asynchronous programming (0.5 classes)</li> <li>10. Interrupt and signal (0.5 classes)</li> <li>11. Semaphore and synchronization (3.5 classes)</li> </ol>

	12. Deadlocks (2.5 classes) 13. Partitioning and protection of memory management (2 classes) 14. Virtual memory: Segmentation and paging (2.5 classes) 15. File system: file I/O and attributes (1.5 classes) 16. Directory structure and Standard I/O (1.5 classes) 17. IO System (1.5 classes) 18. Mass storage and access scheduling (2 classes) 19. Network and parallel programming models (0.5 classes) 20. Distributed file systems (0.5 classes) 21. Load balancing (0.5 classes) 22. Exams (1 classes and final exam period)
<b>Syllabi approved by</b>	Dongsoo S. Kim
<b>Date of approval</b>	11/30/2021