Course Title	**CS837 Advanced Operating Systems**
Credit Hours	3+0
Prerequisites:	▪ Operating Systems
Course Description:	The purpose of this course is to teach the design of operating systems and other systems. Topics covered include concepts of operating systems and systems programming; utility programs, subsystems, multiple-program systems; processes, inter-process communication, and synchronization; memory allocation, segmentation, paging; loading and linking, libraries; resource allocation, scheduling, performance evaluation; I/O systems, storage devices, file systems; basic networking, protocols, and distributed file systems, protection, security, and privacy.
Tools and Technologies:	▪ Operating Systems simulators such as Nachos from University of Washington and Minix3 will be used.
Learning Outcomes:	On successful completion of this course students will be able to: 1. Design and implement systems-level software 2. Understand how real operating systems work 3. Conduct research and development in various CS specializations
Text Books:	Abraham Silberschatz, Peter Galvin, and Greg Gagne: Operating System Concepts, (John Wiley and Sons).
Reference Books:	Andrew S. Tanenbaum: Modern Operating Systems (Prentice Hall).
Course Contents:	▪ Introduction to Operating System ▪ Processes and Threads o Thread Dispatching, Cooperating Threads, Mutual Exclusion, Semaphores, Monitors, Locks and Condition Variables, Readers/Writers, Language Support for Synchronization ▪ Cooperating Processes and Deadlock ▪ CPU Scheduling ▪ Protection: Kernel and Address Space ▪ Memory Management and Address Translation o Caching and TLBs, Caching and Demand Paging, Virtual Memory, Page Allocation and Replacement ▪ File Systems and Disk Management o Storage Devices, Naming and Directories ▪ Advanced Topics o Virtual Machines, Virtualization, Multicore Support, Distributed OS