 Academic Org: Dept of Computer Sci & Engg – Subject: Computer Science

Course: CSCI4200   **Course ID:** 014765   **Eff Date:** 2025-07-01   **Crse Status: Active**   **Apprv. Status:** Approved   **[New Course]**

Operating System Engineering 操作系統工程

This course introduces fundamental design and implementation in the engineering of operating systems. Students will learn how to implement a small operating system with a step-by-step approach through hands-on experiences. Topics include booting, user/kernel mode, interrupt/exception, system calls, tasking, paging, interrupt handling, IO and terminal, context switch, block device driver, file systems, virtual memory and process implementation.

本科介紹操作系統工程的基本設計和實現。學生將透過實踐逐步學習如何實現一個小型操作系統。主題包括啓動、用戶／核心模式、中斷／異常、系統調用、任務、分頁、中斷處理、IO 和終端、上下文切換、區塊設備驅動程式、文件系統、虛擬內存和進程。

Grade Descriptor: A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

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MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:
Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis: Graded
Repeat for Credit: N
Multiple Enroll: N
Course Attributes:

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will be able to:
1. Understand key design principles in the engineering of operating systems
2. Acquire system programming skills and hands-on experiences in implementing a small operating system

Course Syllabus:

Week 1: Booting
Week 2: User/Kernel Mode
Week 3: Interrupt and Exception
Week 4: System Calls

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Week 5: Tasking
Week 6: Paging
Week 7: Interrupt Handling
Week 8: IO and Terminal
Week 9: Context Switch
Week 10: Block Device Drivers
Week 11: File Systems
Week 12: Virtual Memory
Week 13: Process

Assessment Type:

Examination	: 40%
Homework or assignment	: 40%
Lab reports	: 5%
Project	: 15%

Feedback for Evaluation:

1. Course evaluation and questionnaire;
2. Results of assignments and examination;
3. Question-and-Answer sessions during class;
4. Student consultation during office hours or online

Required Readings:

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Recommended Readings:

1. Orange'S: The Implementation Of An Operating System, Yuan YU, Publishing House of Electronic Industry, China, 2009.
2. A Heavily Commented Linux Kernel Source Code, Zhao Jiong, https://www.oldlinux.org, 2019.
3. Operating Systems Design and Implementation, 3rd Edition. Andrew S. Tanenbaum and Albert S. Woodhull, Pearson Prentice Hall, 2006.

OFFERINGS

1. CSCI4200	Acad Organization=CSD; Acad Career=UG

COMPONENTS

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LAB : Size=50; Final Exam=N; Contact=1
LEC : Size=50; Final Exam=Y; Contact=2
TUT : Size=50; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CSCI4200

Enrollment Requirement Group:
Pre-requisite: CSCI3150 or ESTR3102

New Enrollment Requirement(s):
Pre-requisite = CSCI3150 or ESTR3102

Additional Information

VTL-Onsite face-to-face hrs   0
VTL-Online synch. hrs   0
VTL-Online asynch. hrs   0
No. of micro-modules   0
Research components (UG)   1% - 49%

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