

**ITE 240 Operating Systems**

**Course Syllabus**

**Course Code:** ITE 240 **Course Title:** Operating systems

**Credit:** 4 (4-0-8) **Lecture Hours:** Tuesday **/**Friday 12:30-02:30

**Semester:** I **Practice Hours:** 0

**Academic Year:** 2019 **Prerequisites:** - None

**Curriculum:** Undergraduate **Course status:** Basic Core Course

**Major instructor:** Dr.Surekha Lanka **Sec:** 01

1. **Course Description**

This course covers principles of operating systems, process management, memory management, auxiliary storage management, resources allocation; internal representation of instructions and data, instruction execution, addressing techniques, assembly language features, macro definition and use; assemblers, linkers, and loaders.

1. **Instructor Information**

Surekha Lanka

Office: 6th floor, Building 2

Office hours: By appointment

Email: surekha.lanka@stamford.edu

1. **Course Behavioral Objectives**

Upon completing this course, students will:

* Understand the fundamentals of information technology
* Learn core concepts of computing and modern systems
* Understand modern software programs and packages
* Learn about upcoming IT technologies

1. **Teaching and Learning**

* This class will immerse you in the study of general information technology. Class will be focus on the lecture and class discussion.
* Each of you is expected to be a prepared and engaged contributor to class.

1. **Evaluation and Grading Scale**

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| --- | --- |
| **Total Points Course Grade**  91-100 A  85-89 B+  80-84 B | 75-79 C+  70-74 C  65-69 D+  60-64 D   * 1. F |

1. **Course Deliverables**
2. Exercises and Assignment: this can be individual or group work that you will complete and submit on the specified due date.
3. Project: There will be 2 projects that will help you to learn about the subject. Before and after the term exams

|  |  |
| --- | --- |
| Participation | 10% |
| Assignment | 15% |
| Quiz | 5% |
| Case study | 20% |
| Midterm exam | 20% |
| Finals | 30% |
| TOTAL | 100% |

1. **Textbook**

1. Major Documents and Textbooks

Text Book: 1. Operating Systems, Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, John Wiley Publ., Seventh Edition.

Reference Books: 1. Modern Operating Systems, Andrew S. Tanenbaum, , 2 nd edition, 1995, PHI.

2. Operating Systems, William Stallings 5th Edition - PHI 3. Operating Systems: A Design-Oriented Approach’, Charles Crowley, ‘Tata Hill Co.,1998 edition.

**Other Learning Materials:**

* E-learning
* Textbook
* Website
* YouTube

1. **Course Policies**

## Class Format

This class requires four hours a week of in-class learning. Topics related to information technologies and information systems that will be discussed in class and also case studies will be assigned as in-class work or homework. A practical session will also be conducted after the lecture session each meeting. During the class session, you are encouraged to participate as a member of the team or working individually during the lecture sessions and practical sessions. You are expected to come prepared for topic discussions in the class and should complete your homework on due date.

## Attendance Policy

Thailand Ministry of Education stipulates that students must attend 80% of class meetings to qualify for taking the final course examination. Thus, if you miss more than 20% of class meetings, or 5 class meetings, ***for any reason***, you will not be allowed to take the final exam. I will take roll during the ***first five minutes of class***. If you miss your name on the roll call, it will constitute one late arrival. If you are thirty minutes late or more, you will be counted “Absent.” *In Case You Are Late or Absent:*It is your responsibility to get the class materials and handouts. In nearly every case, class handouts will be available on the e-learning web site. No make-up or extra credit work will be accepted.

## Student Class Conduct Policy

Any acts of classroom disruption that go beyond the normal rights of students to question and discuss with instructors the educational process relative to subject content will not be tolerated. This includes using your workstation, laptop or mobile phone for personal communication and/or entertainment during the class period. Remember, your inconsiderate actions will affect your classmates’ learning.

## Electronic Devices in Class Policy

Cellphones, MP3 players, and similar devices must be **turned off or silent** in the classroom. Laptop computers may be used in lecture for the purpose of taking notes and completing class assignments.

**English in Class**

This is an international university where the language of instruction is English, thus we will use only English in class. Remember, not everybody in class speaks your native language, so be courteous and inclusive by speaking only English.

**Examination Policy**

See the *STIU Student Handbook*. Remember, if you cheat on the midterm or final exam, you will automatically fail all classes you are registered for this semester. Uniforms are not required for this class on exam days.

## Appeals Policy

To appeal a grade on an assignment, send an e-mail to your instructor's e-mail address within one week of receiving the grade. Overdue appeals will not be considered. The course grade may be appealed during the Grade Recheck period in the first two weeks of next term.

**Incomplete Policy**

You will not be given an incomplete grade in the course without sound reason and documented evidence as described in the *STIU Student Handbook*. In any case, to receive an Incomplete, you must be passing and must have completed a significant portion of the course.

**Cheating Policy**

You are expected to uphold Stamford International University’s standard of conduct relating to academic honesty as described in the *STIU Student Handbook*. You assume full responsibility for the content and integrity of the academic work you submit. The guiding principle of academic integrity shall be that a student's individual course deliverables, examinations, reports, and projects must be that of the student's own work. You shall be guilty of violating the honor code if you:

* Plagiarize, i.e. represent the work of others as your own is leads to reject the Assignment/Project
* Use or obtain unauthorized assistance in any academic work, including exams
* Give unauthorized assistance to other students, including exams
* Modify, without instructor approval, an examination, paper, record, program, or report for the purpose of obtaining additional credit.
* Misrepresent the content of submitted work.

For this class, general advice and interaction are encouraged. Each person, however, must develop his or her own original code. Unauthorized collaboration constitutes cheating. You may not use or copy (by any means) another's work (or portions of it) and represent it as your own.

**Activities and Project Integration**

Each chapter builds upon a previous chapter, and by the end of the course, you will develop event-driven object-oriented applications that use different data types and algorithms to address different problems and opportunities.

**Schedule of Activities**

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| --- | --- | --- | --- |
| Week / Topics | Outlines | Behavioral Objectives | Activities |
| **Week 1** | Introduction to Operating Systems: Over View of Operating Systems, Types of Operating Systems, Operating System Structures, Operating System Services, System Calls, Virtual Machines, Operating System Design and Implementation. | The student understands OS evolution, its structure and services provided by it | Lecture  Assignment (1) |
| **Week 2** | **Process Management:** Process Concepts, Operations on Processes, Cooperating Processes, Threads, Inter Process Communication, | Learn process life cycle, process scheduling objectives, policies and mechanisms, | 10 min review of previous class Lecture  Class quiz(1) |
| **Week 3** | **Process Management:**  Process Scheduling, Scheduling Algorithms, Multiple - Processor Scheduling, Thread Scheduling | Learn process management ,algoritms | Lecture  -Questions solving on Assignment(2) |
| Week / Topics | Outlines | Behavioral Objectives | Activities |
| **Week 4** | - **Process Synchronization:** The Critical Section Problem, Peterson’s Solution, Synchronization Hardware, Semaphores, | Learn process synchronization, critical Section Problem, Dealing with MUTEX | 10 min review of previous class Lecture  - Class quiz(2) |
| **Week 5** | **Process Synchronization**-Classical Problems of Synchronization, Critical Regions, Monitors. | Learn process synchronization, inter process communication | Lecture  -Questions solving on Assignment (3) |
| **Week 6** | Midterm | Midterm | Midterm |
| **Week 7** | **Deadlocks:** System Model, Deadlock Characterization, Methods For Handling Deadlocks, Deadlock Prevention, Avoidance, Deadlock Detection, Recovery from Deadlocks | Learn deadlocks and other process subsystem related concepts | 10 min review of previous class Lecture  Class quiz(3) |
| **Week 8** | **Memory Management:** Logical versus Physical Address, Swapping, contiguous memory allocation, paging, | Learn memory Physical and logical adress, paging concepts | Lecture  - Assignment (4) |
| **Week 9** | **Memory Management:** structure of the page table , segmentation, Virtual Memory, 22 Demand Paging, Page Replacement, Allocation of Frames, Thrashing, Memory- Mapped files | Learn memory hierarchy, allocation and deallocation policies | 10 min review of previous class |
| **Week 10** | **File Systems,** Implementation, and Secondary- storage Structure: Concept of a file, Access Methods, Directory Structure, Protection, File System Structure, Allocation Methods, | Learn mechanism for main and auxiliary memory, | Lecture  - Assignment (5) |
| **Week / Topics** | **Outlines** | **Behavioral Objectives** | **Activities** |
| **Week 11** | **File SystemsFree Space Management, Directory Management, Device Drivers, overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management.** | **Learn file system design and implementation issues.** | **10 min review of previous class** |
| **Week 12** | **Case study: Overview of LINUX, Windows Operating systems** | **Final Presentation** | **Final Presentation** |
| **Week 13** | **-** | **-** | **-** |

Reviewed and approved:

Surekha Lanka Dr. ChaklamSilpasuwanchai

Lecturer Head of IT program