Computer Science Department
cs.salemstate.edu\dept

SYLLABUS **Fall 2012**

CSC 280 Operating System Principles **3.0 credits**
Prerequisite(s): CSC 260

Instructor: Beifang Yi **Office**: MH 211A **Phone**: (978) 542-7246
email: byi@salemstate.edu **Hours**: T & R (10:50-1:30) **Web Site**: http://cs.salemstate.edu/~byi/
T (4:30-6:00pm, 10:00pm-10:30pm), W & F (12:50-1:20)

Section	Time	Room	Final Exam
01	T & R 8:00—9:15am	MH 301	**Monday 12/17, 8:00am-10:00am MH 301**

Catalog description:
This course presents the evolution of computer operating systems, operating system functionalities, and current design and implementation techniques. Relationships between the operating system, computer architecture, and the user community are discussed. Three lecture hours per week.

Course Goals:
The aims of this course are:
- CG1: to present a descriptive overview of modern operating systems, their purposes and design principles;
- CG2: to discuss the most important ingredients, techniques, and algorithms used in their construction.

Course Objectives:
Upon completion of this course, the student will have demonstrated the ability to:
- CO01: summarize the development of operating systems from single-user and batch processing mainframes to modern multitasking systems
- CO02: describe the mechanisms of interrupts and Direct Memory Access;
- CO03: describe how a process or task is represented in a modern computer system;
- CO04: differentiate between the concepts of process and thread and describe the behavior of a multithreaded system;
- CO05: describe the system components, actions, and algorithms involved in scheduling and managing concurrent processes;
- CO06: describe the concept of deadlock and the common techniques for recognizing, predicting, avoiding, and recovering from it;
- CO07: describe the common techniques and problems involved in memory management, including paging and virtual memory;
- CO08: describe the common techniques and problems involved in management of disk storage;
- CO09: describe the common techniques and problems involved in file management;
- CO10: describe the common techniques and problems involved in system protection and security

Course Topics:
A detailed topics list and a general course bibliography can be found on the Computer Science Department website at http://cs.salemstate.edu/dept/index.php?page=184. Select CSC 280 to access a PDF document.

The focus of the course is on a general discussion of the nature and functionality of operating systems. There is no extended treatment of specific case studies, although examples drawn from specific systems are used to illustrate major concepts. In addition to the topics listed in the above link, we may also briefly introduce the following special purpose systems:

- threads and thread programming
- virtualization/virtual machines
- Linux

Text(s): (required) **Principles of Modern Operating System**, 2nd Edition, by J. M. Garrido, R. Schlesinger, and K. Hoganson. Jones & Barlett Learning, 2013. (ISBN-13: 978-1-4496-2634-1)

Required Material:

(Required) Thumb (flash) drive, 2 GB minimum**.**

Additional references (optional)**:**

- *Operating System Concepts with Java*, 8th Edition, by Silberschatz, Galvin, and Gagne. John Wiley & Sons. Inc., 2010.
- *Operating Systems: Internals and design Principles* (6th edition, 2008) (GOAL Series), by William Stallings. Prentice Hall.
- *Understanding Unix/Linux Programming: A Guide to Theory and Practice* (2003), by Bruce Molay. Prentice Hall.
- *Java: How to Program*, 8th edition. Deitel & Deitel. Prentice Hall, 2010.
- VMWare website: http://www.vmware.com/
- (Handouts will be given in class).

Cell phones:

Turn the ringer off, or, better yet, *turn the phone off*.

Class Attendance:

Class attendance is highly recommended. You are responsible for all materials presented in class, quizzes, examinations, and other announcements. No excuses of any nature will be construed as relieving you from the responsibility for completion of the work assigned. Each student is responsible for completing all course requirements and for keeping up with all that goes on in the course (whether or not the student is present).

Final Grade:

Final grade will be determined using the following grading weights:

written assignments	35%
projects	30%
midterm examination	10%
final examination	25%

Attendance is not used to calculate the final grade: *however*, note that you are at all times responsible for assignments and materials presented in class.

The following table shows how the course work is assessed against the course objectives:

	Written Assignments	Projects	Examinations
CO01	✓		✓
CO02	✓		✓
CO03	✓	✓	✓
CO04	✓	✓	✓
CO05	✓	✓	✓
CO06	✓	✓	✓
CO07	✓	✓	✓
CO08	✓	✓	✓

CO09	✓		✓
CO10	✓		✓

Projects:

There will be several projects (a significant portion of which are programming projects) to be completed throughout the semester. The programming languages and platforms will vary (C/C++, Java,…Windows, Linux…) and will be given out in class. These projects will help students understand the basic concepts of modern operating systems and get hands-on experience in the implementation of some functions of operating systems. There is a deadline to each project and penalty will be imposed for each day a project submission is late (including weekends and holidays).

For each project, a write-up should be submitted which describes the problem, solutions, and other requirements (usually, there are additional requirements for the assignments). For a programming project, it should provide the following: (a) instructions on how to compile and run the program, (b) testing results, (b) source code, and (d) input data.

There will be bonus projects given in the semester which are optional for bonus project credits.

Submission Deadlines/Late Penalties:

There are specific due dates/times for any assignments (written homework assignments, projects) and these assignments should be completed by the deadlines. **A penalty of 2%** will be applied for late submission for each day (including weekends and holidays). No missed presentations will be made up unless under extreme circumstances with advanced notification of the instructor and/or certain supporting documentation.

All the assignments must be submitted at Canvas—the course online management system. Students may not turn in your assignment through emails or in printed copy format. Canvas will keep your last submission (usually, your new submission will automatically be replaced by the old one for the same assignment; thus it is the ***latest*** submission that will be graded by the instructor, whether it has been submitted on-time or late.). Extension of deadlines will be granted under exceptional circumstances (such as medical emergencies) and with supporting documents—in such cases, students must obtain emails from the instructor as the proof of deadline extensions.

All the assignments will be announced/given in class and/or through course website.

No assignment submissions will be accepted after the final examination.

Exams:

There will be one midterm (10% total) and one final (comprehensive) exam (25% total). The midterm will be held in week 8 *depending* on class progress. **Note:** Make-ups are given for examinations only under exceptional circumstances and with documented circumstances.

Missed Tests:

Missed tests will be made up *only under extreme conditions/emergency with the proper documentation*. Students who know in advance that they must be absent on an exam day for an excusable reason should notify the instructor prior to the exam day. Students who are absent on the day of the exam for an excusable reason should contact the instructor immediately following their absence. Makeup work will be permitted *only when* the instructor is presented with acceptable documentation for acceptable absences. It is your responsibility to notify your instructor of any excused absence as far in advance as possible.

Due Dates:

- **There will be a 2% penalty for each day (including weekends, holidays) an assignment (projects, assignments, etc.) is late**; penalties accrue at 12:00 midnight of the assigned due date.
- **No assignments will be accepted after the final examination**.

Written Assignments:

There will be a series of written assignments from the textbooks and other sources: question-answering and short essay-writing. Reading assignments will be a part of the written assignments. All assignments are due at the time to be set by the instructor. A 2% penalty will be imposed for each day (including weekends and holidays) an assignment submission is late.

Study Groups:

While I strongly encourage study groups, I require that each student hand in his/her answers in her/his own words - if two answers are highly similar to each other, neither will receive credit.

When working on your programming projects, you may discuss with others the project topics, the algorithms and methodologies related to the project; but when you work on writing the code, this coding work should be 100% of your own work. **If two answers/written code segments come out exactly the same or highly similar, neither will receive credit and/or further actions will be taken** (such as reporting to the department and/or university). Given the nature of most of the projects, homework questions and writing assignments, it will be almost impossible for two people to come up with highly similar answers UNLESS they copy.

Academic Integrity:

Academic Integrity Policy and Regulations can be found in the University Catalog and on the University's website (http://catalog.salemstate.edu/content.php?catoid=13&navoid=1295#Academic_Integrity). The formal regulations are extensive and detailed - familiarize yourself with them if you have not previously done so. A concise summary of and direct quote from the regulations: "Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts". *Submission of other's work as one's own without proper attribution is in direct violation of the University's Policy* and will be dealt with according to the University's formal Procedures.

"Salem State University is committed to providing equal access to the educational experience for all students in compliance with Section 504 of The Rehabilitation Act and The Americans with Disabilities Act and to providing all reasonable academic accommodations, aids and adjustments. Any student who has a documented disability requiring an accommodation, aid or adjustment should speak with the instructor immediately. Students with Disabilities who have not previously done so should provide documentation to and schedule an appointment with the Office for Students with Disabilities and obtain appropriate services."

In the event of a University declared critical emergency, Salem State University reserves the right to alter this course plan. Students should refer to http://www.salemstate.edu for further information and updates. The course attendance policy stays in effect until there is a university declared critical emergency. In the event of an emergency, please refer to the alternative educational plans for this course located at http://cs.salemstate.edu/~byi/2012Fall/CSC280/emergency/index.html. Students should review the plans and gather all required materials before an emergency is declared.

Please remember that if, for any reason, you decide to drop this course, you **MUST** do so officially through the Registrar's office. The last day to withdraw from a course this semester is **November 26th**.

Note: This syllabus represents the intended structure of the course for the semester. If changes are necessary, students will be notified in writing and via all regular class communication mechanisms (class discussion, emails, and/or the instructor's website at http://cs.salemstate.edu/~byi/).