Instructor Contact Information:
Name: Dr. Tim Nix
Office: STEM 312C
Phone: (936) 468-1619
E-mail: timothy.nix@sfasu.edu
Office Hours: Mon 10:00AM – 11:00AM
2:20PM – 3:20PM
Tue 10:00AM – 11:00PM
1:00PM – 2:00PM
Wed 10:00AM – 11:00AM
2:20PM – 3:20PM
Thu 10:00AM – 11:00PM
1:00PM – 2:00PM
Other times by appointment

Lecture Schedule:
TueThu 1:00PM – 2:15PM STEM 417

Course Purpose: The purpose of this course is to enable the student to develop an understanding of the integral role played by operating systems in a computing system. The components of an operating system are studied along with the interactions between software, hardware, and the user.

Course Description: CSC341 covers the fundamentals of operating systems design and implementation. Topics include an overview of the components of an operating system, mutual exclusion and synchronization, implementation of processes, scheduling algorithms, memory management, operating system security, and file systems.

Prerequisite: CSC 214: Computer Organization and Architecture;
CSC 302: Data Structures.


Suggested Items: USB Flash Memory Drive (64 MB minimum)
Course Objectives:
1. Recognize, describe, define, and differentiate the major concepts embodied by modern operating systems.

2. Compare and contrast different methods of process scheduling, process synchronization, memory management, file system management, protection, and security.

3. Understand the key mechanisms and choices that must be considered in the design, selection, and employment of a modern operating system.

4. Apply basic conceptual knowledge to solve operating-system problems.

Topics:
- Introduction .......................................................... 2
- Process Management .................................................. 9
- Memory Management ................................................ 6
- Scheduling Theory ..................................................... 6
- Storage Management .................................................. 6
- System Libraries and Utilities ................................. 3
- Concurrency and Parallelism ..................................... 3
- Protection and Security ............................................. 6
- Exams (3 plus Final) .................................................... 5

Grading Policy:
Graded Programming Assignments 25%
Graded Homework Assignments 25%
Exams 25%
Final Exam – Comprehensive 25%
Total: 100%

Grading Rubric:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Assigned Score (s)</th>
<th>Definition</th>
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<tbody>
<tr>
<td>A</td>
<td>90 % ≤ s &lt; 90 %</td>
<td>Mastery</td>
</tr>
<tr>
<td>B</td>
<td>80 % ≤ s &lt; 80 %</td>
<td>Good Understanding</td>
</tr>
<tr>
<td>C</td>
<td>70 % ≤ s &lt; 70 %</td>
<td>Adequate</td>
</tr>
<tr>
<td>D</td>
<td>65 % ≤ s &lt; 65 %</td>
<td>Probably Failed to Demonstrate</td>
</tr>
<tr>
<td>F</td>
<td>s &lt; 65 %</td>
<td>Definitely Failed to Demonstrate</td>
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Course Calendar
This course meets for a minimum of 37.5 lecture contact hours during the semester, including the final exam. Students have significant weekly reading assignments. Students are expected to complete homework assignments, programming assignments, and periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

Tentative Topic Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Jan 15 – Jan 17</td>
<td>Introduction to Operating Systems and Linux</td>
</tr>
<tr>
<td>Jan 20 – Jan 24</td>
<td>C on Linux and POSIX System Calls</td>
</tr>
<tr>
<td>Jan 27 – Jan 31</td>
<td>Operating System Overview</td>
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<tr>
<td>Feb 03 – Feb 07</td>
<td>Process Description and Control</td>
</tr>
<tr>
<td>Feb 10 – Feb 14</td>
<td>Threads</td>
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<tr>
<td>Feb 17 – Feb 21</td>
<td>Concurrency: Mutual Exclusion and Synchronization</td>
</tr>
<tr>
<td>Feb 24 – Feb 28</td>
<td>Concurrency: Deadlock and Starvation</td>
</tr>
<tr>
<td>Mar 02 – Mar 06</td>
<td>Exam I / Review</td>
</tr>
<tr>
<td>Mar 07 – Mar 15</td>
<td>Spring Break</td>
</tr>
<tr>
<td>Mar 16 – Mar 20</td>
<td>Memory Management</td>
</tr>
<tr>
<td>Mar 23 – Mar 27</td>
<td>Virtual Memory</td>
</tr>
<tr>
<td>Mar 30 – Apr 03</td>
<td>Scheduling Algorithms</td>
</tr>
<tr>
<td>Apr 06 – Apr 08</td>
<td>Exam III / Review</td>
</tr>
<tr>
<td>Apr 09 – Apr 12</td>
<td>Easter Break</td>
</tr>
<tr>
<td>Apr 13 – Apr 17</td>
<td>I/O Management and Disk Scheduling</td>
</tr>
<tr>
<td>Apr 20 – Apr 24</td>
<td>Disk and File Management</td>
</tr>
<tr>
<td>Apr 27 – May 01</td>
<td>Operating System Security</td>
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</tbody>
</table>

Tentative Exam Dates:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>03/02/2020</td>
<td>Monday</td>
<td>Exam 1</td>
</tr>
<tr>
<td>04/06/2020</td>
<td>Monday</td>
<td>Exam 2</td>
</tr>
<tr>
<td>05/06/2020</td>
<td>Wednesday</td>
<td>Final Exam</td>
</tr>
</tbody>
</table>

Examinations: There will be two regular exams during the semester and a final exam. All exams are comprehensive. The regular exams will be given during the scheduled lecture period. Exams must be taken during the class period on the date scheduled. No makeup exams will be given. Combined, the regular exams are worth 25% of the final grade. The final exam will be taken in accordance with the final exam schedule and is worth 25% of the final grade. There are no exemptions from the final examination and no changes in taking the final
examination. Check the final exam time. If the final exam time is a problem, you need to drop this course.

**Graded Assignments:** There will be 5-7 programming assignments. Programming assignments will be worth 25% of the total grade. There will also be 5-7 graded homework assignments that focus on definitions and concepts. Homework assignments will also be worth 25% of the total grade.

**Policy Regarding Help on Graded Assignments:** Both programming and homework assignments are restricted to individual effort, and you may not receive help from another student. Any other resource used, other than the instructor or the course text, must be explicitly documented in your submission detailing the source and describing what was learned and how that information was used. You may receive help from the AARC, but you must clearly document what help was received. Submissions will be severely penalized if:

- copied in part or in whole from any source;
- the result of excessive help from any other individual; or
- documentation is missing, inadequate, or vague.

**Late Submissions:** All homework assignments are due no later than the time and date specified in the assignment. Assignments will not be accepted after the specified date and time.

**Expectations of Students:**

- **Come to class prepared and take notes.** I expect you to have read the assigned readings. Class time is primarily for extending and applying what you learn from the readings. If you come unprepared, you will get significantly less out of class and quickly fall behind. Be an active note-taker. **Never come to class without paper and pen/pencil.**

- **Attend the lectures and be on time.** There will be times when your alarm clock goes off and you will want to skip class and sleep instead. Others may have jobs that will potentially conflict with lecture periods. Make your education a priority. During the lectures, I will reinforce material from the textbook and also cover things that are not in the textbook. You will still be responsible for this material. Missing class should be a rare occurrence. If you do miss class, get the notes from another student. See me during my office hours for clarification of any missed material.

- **Take ownership of your learning.** You are solely responsible for how much you get out of this course. It is not my responsibility to spoon-feed you knowledge, but rather to guide you along your own developmental path. I hope that this course will challenge you. Deep learning happens when you struggle and succeed. In class, your participation and undivided attention are critical. On the assignments, leaning too much on looking at someone else's code robs you of learning and tricks you into thinking you understand more that you do.

- **Seek my help early if you feel lost.** If you are doing the readings, attending the lectures and taking copious notes, and yet you still feel lost, do not convince yourself that things will get better on their own or that you will catch up this weekend. This course, like most others, builds on itself throughout the semester. Come see me before the feelings of confusion compound.

**Program Learning Outcomes:** Program learning outcomes define the knowledge, skills, and abilities students are expected to demonstrate upon completion of an academic program. These learning outcomes are regularly assessed to determine student learning and to evaluate overall program effectiveness.
CLASS INFORMATION AND POLICIES
Department of Computer Science, STEM 312, 468-2508

Attendance: Seating assignments will be made and roll will be taken regularly. Attendance may be taken into consideration for your final grade. If you come to class, you are expected to be present and awake the entire class period unless you have been given permission to leave early. If you are absent from class, please make sure to get notes from a classmate. There will be no smoking, no chewing of tobacco, no eating or drinking, no bare feet, and no cell phone use during class. Cell phones and other electronic communication devices must be turned off during class. Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero. No disruptive behavior including offensive language will be tolerated in a computer science facility or related activity. Such behavior may result in administrative removal from class. Only students officially registered for the course and approved assistants may attend class. Please do not walk across the front of the room after the class has started. Students entering the classroom after the lecture has started should take a seat in the back of the room.

Examination Policy: All class examinations are considered to be a major part of the course work upon which a large part of the course grade depends. There are NO make-up exams! Class examinations will be announced at least two classes prior to the examination. If you have a conflict with another university event, you must contact me well in advance of the examination. In case of an extreme emergency, contact me before the scheduled examination. Failure to do so may result in an examination grade of zero. There are no exemptions for the final exam. A zero on the final exam will result in an F in the course. Check the final examination time. If the final examination time is a problem, you need to drop this course. Once the first person has left the room on the day of an examination, no one else will be permitted to begin the exam.

Assignment Policy: All assignments are due at the announced time on the specified due date. Assignments will not be accepted late. If you have a conflict, please contact me in advance. You should turn in your homework assignments done neatly, clearly, and to the best of your ability. Follow all the instructions given. You will lose points for failure to follow instructions. Any work turned in to my box should be dated and timed by the CSC department staff. Please ask nicely. DO NOT slide any work under my office door or under the door to the Computer Science offices. PLEASE NOTE: You may be given assignments during the last five class days of the semester.

Software Policy: Disciplinary action will be taken against individuals who perform unauthorized duplication of software or who are involved in the unauthorized use of duplicated software. Such action may make it impossible for you to successfully complete this course.

Computer Laboratory Usage: Students utilizing equipment in university computing laboratories are expected to read and abide by all posted policies for the laboratories. Please note that no children and no pets are permitted in university computing laboratories.
Drop Policy (Univ.): The official university add/drop policy is located at:
https://www.sfasu.edu/policies/course-add-drop_6.10.pdf. If you have questions concerning registration, add/drop or the withdraw process, contact the Registrar at (936) 468-2501 or Email: registrar@sfasu.edu. The Registrar is located on the 2nd floor of the Rusk building.

Special Accommodation Requests: To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/. Students with special accommodation requests have the responsibility to immediately initiate a meeting with the instructor to discuss how the special accommodations will be provided. Students who are aware of these special needs at the beginning of the semester must inform the instructor in person before the twelfth class day about any class activity, which will require special accommodations.

Computer Account Policy: All assignments that require the use of the University Computer must be done under the computer account that is assigned to you in this class. You should NOT do other class assignments in this account, and you should NOT do assignments from this class in other accounts. Failure to abide by the above statements will mean that you will received a grade of F in this course.

Academic Integrity: Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own.

Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit. All instances of academic dishonesty will be reported to Office of the Dean of the student’s major. This report shall be made part of the student’s record and shall remain on file with the Dean’s office for at least four years. Instances of academic dishonesty may also be reported to the University Committee on Academic Integrity. A student who wishes to appeal decisions related to academic integrity follows procedures outlined in University policy A-9.1. Please read the complete policy at https://www.sfasu.edu/policies/4.1-student-academic-dishonesty.pdf.

If in my judgment an instance of academic dishonesty on an examination has occurred, a grade of zero will be assigned as the examination grade and a minimum of one (1) letter grade will be lost in the course grade. Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero. A course grade of F may be
assigned depending on the situation. A student found cheating on an examination may not drop the course. If in my judgment a student is found cheating on any part of a homework assignment or quiz, the student will receive negative points equal to the value of the entire homework/quiz. A negative grade will not be replaced by any possible bonus assignment. I consider the person who did the work (homework, quiz, or test) and the person copying the work as both cheating. A recurrence of this by any individual will result in a grade of F in the course. DO YOUR OWN WORK!!!! Do NOT show your code to other students!!!

Withheld Grades Semester Grades Policy (A-54): Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Acceptable Student Behavior: Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic, or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

Identification: Valid student I.D. cards must be presented on each examination day. (No I.D...No exam...Grade of zero