Course Description
The course covers the key concepts in modern operating systems. The specific topics include process management, synchronization mechanisms, scheduling strategies, deadlock detection/avoidance and prevention, memory management, file systems, protection and security. Concepts will be reinforced through hands-on application of reading assignments and lecture materials through homework assignment, including programming projects and case studies involving Windows and Unix operating system.

Course Objectives
Upon the successful completion of the course, the students will be able to:

- describe components of operating system and its interaction.
- evaluate various policies for scheduling, deadlock, memory management, synchronization, system calls and file systems.
- design and construct various OS software components like system calls scheduler, memory management and file management.

Materials
Textbook

Grading Scheme
Grading Criteria
10% Weekly Discussions
30% Individual Home Assignments (Programming)
10% Group Project (Programming)
16% 1st Exam
16% 2nd Exam
18% Final Exam

Grading Scale
Grades will follow the standard scale:
A% 90 – 100%
B% 80 – 89.99%
C% 70 – 79.99%
D% 60 – 69.99%
F% < 60%

Note: The total grades shown in Canvas may not reflect the proportions above. So, please either do your own calculation for grades using the proportions or meet the instructor virtually.
Canvas Classroom for the Course

The course uses Canvas which can be accessed at https://canvas.okstate.edu. Students can sign in using their O-Key username and password provided by OSU. After sign-in, students can see the Canvas Dashboard, which provides a list of links for the courses in which they are enrolled. This course will be listed as CS4323-Spring2024-Online. Click on that link to go to the course homepage. Near the left side of that page is a menu of links, with Home (the homepage) at the top. The seven primary sections of the Home page are:

- **Home** (at the top) provides you all the lecture videos and additional materials/handsout for the course. You can find your syllabus in this section.
- **Announcements** (below Home) provides you with important and time-sensitive updates and comments regarding class materials. Please keep track of all the announcements regularly.
- **Assignments** (below Announcements) contains all the documents related to assignments and from this section you will be able to submit your assignments.
- **Discussions** (below Assignments) takes you to the list of course discussion that students need to complete every week. Please keep your comments clean and civil.
- **People** (below Discussions) is where you will find the group members for your project. This is the place which you will be using to communicate with your group members.
- **Grades** (below People) shows student's grades for the course.
- **Zoom** (below Grades) is where the instructor and the TA will hold their office hours.

Since this is an online course, it is students' responsibility to keep track of all announcements, course contents and due dates.

Individual Assignments

The course is categorized into assignments (individual assignments and group project) and weekly discussions. There will be a total of 4 individual assignments. All assignments are compulsory. The due dates for each assignments will be clearly specified in each assignment file. All assignments must be submitted through Canvas. Any submission made through email will not be accepted. All your assignments will be checked in Turnitin for any plagiarism.

Group Project

There will be a group project which has to be completed in a group, where

- each group will be formed randomly by the instructor and students need to work in the assigned group,
- each group has to submit a single progress report, a final report and a complete working codes,
- each student will be graded based on the individual work as well as overall contribution on the final completion of the project,
- incomplete project will lead to partial credit to the entire group.

Discussions

Since this is an online course, discussion forms an integral part of the grade. Each student is expected to post at least three posts in a weekly conversation. The topic of discussion will be given related to the subject matter discussed in the previous week. The students’ post should demonstrate their understanding of the material. Each student should demonstrate that they have observed the video lecture of the past week and have understood the topic well. Based on the video lecture and/or assigned topic, the students should give their response. Students can give multiple views and/or motivate other students' response. Simply by stating “I agree” or “That is an interesting idea” will not earn any credit. Students’ response will be graded based upon their analysis and the critical thinking. Focus will be given to the response that indicates the ability to handle the conceptual ideas rather than the response containing just a fact.

For the 1st post (each Monday – Thursday of the current week), each student needs to post at least one question based on the last week video lectures. Each student needs to post his/her question within 3 days from the day link is made available. When posting question, you have to give what you understood first then the confusion/doubt you have on that topic. This will help other students to answer your doubt clearly. In the 2nd post (each Thursday – Saturday of the current week), each student needs to submit his/her answer to somebody’s else question. In the 3rd post (each Sunday of the current week), each student needs to post his/her final understanding on the question he/she has posted on the 1st post. If any student is not satisfied by any answers posted by fellow students or does not receive any response, then students are encouraged to contact me and write appropriate response by the specified duration. In any case, each student need to make all 3 posts each week to get full credit. Students are free to post as many questions as they want and answer multiple times. However, I will look for the quality of the post. So, all the questions and answers must be relevant. Grading will be done based on the post that falls within the specified duration.
Exam Logistics

Exams must be administered by a proctor or proctoring service approved by OSU. The exams must be taken within the days specified:

1st Exam  02/29/2024 (Thu) – 03/01/2024 (Fri)
2nd Exam  04/04/2024 (Thu) – 04/05/2024 (Fri)
Final Exam  05/06/2024 (Mon) – 05/07/2024 (Tues)

We will use Examity for our course and the proctoring service will be Level 3 (i.e. Live Proctoring). You can get additional information here under Proctoring Options. Please go through the following resources to get familiarize with Examity: Live Proctoring Video and Examity Student Guide for Live Proctoring (in pdf).

Students need to pay for this exam service. You can get additional information here under Cost of Examity and Billing.

Grade disputes

Once the grade is displayed on Canvas for any assignment/project/discussion/exam, if students have any question/concern, then it should be resolved within 7 days from the date the grades are displayed. Failure to do so will not change grades after that.

Due dates and Late Work Policy

For each individual assignment, there will be two dates: due date and end date:

- Students need to submit assignments by the due date.
- After the due date, there will be a late penalty, which will be 10% (of the total point received in the assignment) per day till end date.
- After the end date, the link will be disabled and no assignment will be accepted.

For group project, including the progress report, the due date and end date are same. This means there is no late work policy.

For discussions as well, the due date is same as the end date. Failure to post response to any part of the discussion within the specified due date will lead to 0 for that particular post.

Collaboration Policies

Academic integrity is taken very seriously. You are permitted (and indeed encouraged) to discuss the course material with fellow students in general terms on the Canvas discussion board, but the materials you submit on Canvas must be your own original work. Copying another person’s work, in part or in whole, is not allowed. Sharing solution, in part or in whole, is considered cheating as well. Any violation found will result in an automatic zero, and depending on the egregiousness of the offence may result in earning an ‘F!’ for the course and facing academic disciplinary measures. You have the right to appeal the charge. Go to http://academicintegrity.okstate.edu/ for a video on OSU’s academic integrity policy and additional information. If any student is unsure whether collaboration is acceptable, speak with the instructor in advance. Students are responsible to take care of their solutions and prevents it from leaking.

Getting Help in this Course

If any students need any additional help, they are encouraged to email the instructor at the instructor's email address. The typical respond time will be within 24 hours. For prompt response, please include the course number in the square bracket, followed by the brief message subject; for example:

[CS 4323: Online] Compilation error: Segmentation fault

Students are supposed to use official email address for any correspondence. The instructor/TA will be very rarely checking the Canvas inbox. So, please use email for reaching to the instructor/TA.

The OSU community is here for you and wants to provide all the tools and resources to best support your mental health. If you or someone close to you is having a difficult time, our mental health resources https://wellness.okstate.edu/student-
wellness/resources.html are available to help. Whether it’s mental or physical health, we have student wellness resources https://wellness.okstate.edu/student-wellness/index.html to ease the stress of college life.

Reach out to your advisor or instructor if you need support or help in your courses and utilize the many academic resources https://go.okstate.edu/undergraduate-academics/academic-support.html available on campus. Our faculty’s goal is to assist you, whatever the circumstances might be.

We are working to ensure that your time at Oklahoma State is both safe and formative, and many times that begins with your mental well-being.

**Technical Support**

You can reach OSU Arts & Sciences Outreach Office at:

- Email: casoutreach@okstate.edu
- Phone: 1-405-744-5647

**Syllabus Attachment**

Other useful information, such as important dates throughout the semester, can be found on the [here](#).
<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Chapter (Assignment/Project)/Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>01/16</td>
<td>Computer System organization overview, Interrupts</td>
<td>1</td>
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<tr>
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<td>01/21</td>
<td>Operating System Structure, Operations and Functions</td>
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<td>Week 2</td>
<td>01/22</td>
<td>Computing Environment, Virtual Machines</td>
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<td>01/28</td>
<td>O.S. Services, Interface, System Call, System Boot</td>
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<td>Week 3</td>
<td>01/29</td>
<td>Process concept, scheduling and operations</td>
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<td>02/04</td>
<td>Interprocess communication and several examples</td>
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<td>Week 4</td>
<td>02/05</td>
<td>Thread concept, Concurrency and Parallelism</td>
<td>4 (Assignment 01)</td>
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<td>02/11</td>
<td>Thread Management, Thread Models</td>
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<td>Week 5</td>
<td>02/12</td>
<td>Thread Issues</td>
<td>4 (Assignment 02)</td>
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<td>02/18</td>
<td>Process synchronization concept</td>
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<td>Week 6</td>
<td>02/19</td>
<td>Critical-section problem and different solutions</td>
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<td>02/25</td>
<td>Peterson’s solution, Synchronization hardware and Semaphore</td>
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<td>Week 7</td>
<td>02/29/2023 (Thu) – 03/01/2023 (Fri)</td>
<td>1st Exam</td>
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<tr>
<td>Week 8</td>
<td>03/04</td>
<td>Classic problems of synchronization</td>
<td>5</td>
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<td>03/10</td>
<td>Monitors, Introduction to deadlock and its characterization</td>
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<td>Week 9</td>
<td>03/11</td>
<td>Deadlock Avoidance/Prevention/detection and recovery</td>
<td>7 (Assignment 03)</td>
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<td>03/17</td>
<td>Introduction to Scheduling</td>
<td>6</td>
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<td>Week 10</td>
<td>03/18/2024 (Mon) – 03/22/2024 (Fri)</td>
<td>University Holiday (Spring Break)</td>
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<td>Week 11</td>
<td>03/25</td>
<td>CPU scheduling concept, criteria and algorithms</td>
<td>6 (Group Project)</td>
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<td>03/31</td>
<td>Threads scheduling, Real-Time CPU scheduling</td>
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<td>Week 12</td>
<td>04/04/2024 (Thu) – 04/05/2024 (Fri)</td>
<td>2nd Exam</td>
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<td>Week 13</td>
<td>04/08</td>
<td>Introduction to Memory Management, Address Binding</td>
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<td>04/14</td>
<td>Memory Allocation Policies, Paging and Page Structures</td>
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<td>Week 14</td>
<td>04/15</td>
<td>Introduction to Virtual Memory, Demand Paging</td>
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<td>04/21</td>
<td>Page replacement algorithms</td>
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<td>Week 15</td>
<td>04/22</td>
<td>Overview of Mass Storage Structure</td>
<td>10 (Assignment 04)</td>
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<td>04/28</td>
<td>Disk Scheduling Algorithms, RAID levels</td>
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<tr>
<td>Week 16</td>
<td>04/29</td>
<td>Security and Protection in OS</td>
<td>11</td>
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This is just a tentative course schedule. It may evolve throughout the semester.

Each week students have to participate in the discussion as per the instructions.