

THE UNIVERSITY OF TEXAS AT TYLER
DEPARTMENT OF COMPUTER SCIENCE
COSC 5330 – Operating Systems
Fall 2020

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Lecture: Thursday 6.00 pm to 8:45 pm COB 255

Office Hours: Tues/Thurs 8.00 am to 9.30 am (by phone and/or Zoom)

Text: *Operating Systems: Internals and Design Principles* by William Stallings, 9th Edition, Pearson Publishing, ISBN 9780134670959

Catalog Description: Analysis of operating systems software for computing systems, and resource management procedures and techniques used in all types of computing environments. Topics include processes, synchronization, scheduling algorithms, memory management, security, device management, deadlocks, and file systems.

Course Description: Computing devices have become almost omnipresent in our lives and we interact with a variety of different devices on almost a daily basis. Smartphones, digital home assistants, tablets, laptop, desktops, servers, drones, IoTs, and so on – the list is long. But the software that is common to these devices is the operating system (OS). OS is the software that controls accesses to hardware and other software resources. So if an application wants to read user input from the keyboard, it is the OS that sends the keystrokes to the application. Likewise, if an application wants to make a system call then, again, it is to the OS that the application makes this request. Therefore, OS is the most important software on a computing device. There are several different OSes including Windows, Mac OS X, Linux, iOS, and Android, besides others and we will study some of these OSes in detail in this course. All relevant course material will be posted on Canvas.

Grading: Grading will be based on exams and homework. There will be two mid-term exams (as per schedule given later) and the final exam. Midterm exams will be held from 6pm to 7.20pm during their scheduled days. Homework needs to be uploaded to Canvas before the deadline – late submissions will not be graded. Weights are given below:

| | |
|---------------------|-----|
| First Midterm Exam | 25% |
| Second Midterm Exam | 25% |
| Final Exam | 30% |
| Homework | 20% |

Covid Impact: Classes will be based on a combination of in-class and online lectures with most classes being taught using video lectures that will be uploaded to Canvas.

Every student must have their own computer for this class so that they can do the course work. All exams will be online using ProctorU — you must download the ProctorU plugin and you can check the readiness of your computer for ProctorU at <https://test-it-out.proctoru.com/>. If you need any assistance contact the office of digital learning at UT Tyler. Additional ProctorU resources are given on page three.

All exams must be taken on the day and time scheduled; there will be no makeups for missed exams – any missed exams get a grade of zero. Homework submissions need to be uploaded to Canvas and homework will be due before the deadline - late submissions will get a grade of zero.

Grading Policy:

| Points | Grade |
|-----------------|-------|
| ≥ 85 | A |
| $\geq 75, < 85$ | B |
| $\geq 65, < 75$ | C |

Course Objectives:

1. Understand the components of a modern operating system
2. Understand concurrency and file management
3. Analyze differences between operating system

Tentative Schedule:

| <u>Week</u> | <u>Chapter</u> | <u>Topic</u> |
|-------------|--|---|
| 1 | 1 | Computer System Overview |
| 2 | 2 | Operating System Overview |
| 3 | 3 | Process Description and Control |
| 4 | 4 | Threads |
| 5 | 5 | Concurrency: Mutual Exclusion and Synchronization |
| 6 | 6 | Concurrency: Deadlock and Starvation |
| 7 | FIRST MIDTERM EXAM, Thursday, October 8th, 2020 | |
| 8 | 7 | Memory Management |
| 9 | 8 | Virtual Memory |
| 10 | 9&10 | Scheduling |
| 11 | 11 | I/O Management and Disk Scheduling |
| 12 | SECOND MIDTERM EXAM, Thursday, November 12th, 2020 | |
| 13 | 12 | File Management |
| 14 | 14 | Virtual Machines |
| 15 | FINAL EXAM, Week of December 7 th , 2020 (as per University schedule) | |

Census Date: September 4th, 2020

Attendance and Make-up Policy

You must complete homework before their due dates/times; late submissions will get a grade of zero. You must take exams at the date and time scheduled; there will be no make-ups for missed exams - missed exams will get a grade of zero.

ProctorU Resources

<https://www.uttTyler.edu/digital-learning/proctoru-resources/>

The assessments in this online course will be proctored using ProctorU. Beyond the cost of initial equipment needed (e.g. a camera for your computer), there will not be any additional cost for proctoring. You will need to create a ProctorU account and install the ProctorU extension before attempting any assessment. To create a ProctorU account, follow the ProctorU tool within Canvas. Please make sure you are using the current version of Chrome or Firefox and download the ProctorU extension available at

<http://bit.ly/proctoruchrome> or <https://www.proctoru.com/firefox>.

In order to use ProctorU, you will need the following:

- High-speed Internet connection
- Webcam (internal or external)
- Windows, Mac, or Chrome Operating System
- Up-to-date Chrome or Firefox browser and ProctorU extension installed
- Valid photo ID
- Quiet environment to take your assessment

You can visit the Test Taker Resource Page for additional information at <https://bit.ly/ProctorMe>

University Policies

University policies can be seen at <http://www.uttTyler.edu/academicaffairs/files/syllabuspolicy.pdf>. They are given below as well.

UNIVERSITY POLICIES AND ADDITIONAL INFORMATION THAT MUST APPEAR IN EACH COURSE SYLLABUS

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link:

<http://www.uttyler.edu/wellness/rightsresponsibilities.php>

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at

<http://www.uttyler.edu/about/campus-carry/index.php>

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit

<https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

- i. "Cheating" includes, but is not limited to:
 - copying from another student's test paper;
 - using, during a test, materials not authorized by the person giving the test;
 - failure to comply with instructions given by the person administering the test;
 - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
 - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
 - collaborating with or seeking aid from another student during a test or other assignment without authority;
 - discussing the contents of an examination with another student who will take the examination;
 - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
 - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
 - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
 - falsifying research data, laboratory reports, and/or other academic work offered for credit;
 - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
 - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.
- iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
- iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students

- [UT Tyler Writing Center](mailto:writingcenter@uttyler.edu) (903.565.5995), writingcenter@uttyler.edu
- [UT Tyler Tutoring Center](mailto:tutoring@uttyler.edu) (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- [UT Tyler Counseling Center](mailto:uttyler@uttyler.edu) (903.566.7254)

Additional Syllabus Information

Important Covid-19 Information for Classrooms and Laboratories

Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by [Procedures for Fall 2020 Return to Normal Operations](#). The UT Tyler community of Patriots views adoption of these practices consistent with its [Honor Code](#) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Online Learning Student Privacy & Related Issues FAQ

This document is intended to provide general guidance regarding frequently asked questions related to on-line learning environments. This guidance does not supersede institutional policies. Questions regarding specific scenarios or technology should be directed to your institution's office of legal affairs and/or IT office or other appropriate institution offices, including the Provost or your department.

All privacy laws, particularly FERPA, carry potential penalties for non-compliance, including loss of federal funding or other sanctions. The Department of Education has generally indicated a flexible approach where necessary to address the increase in the use of online courses in response to the current COVID-19 pandemic. While it is unlikely that inadvertent FERPA errors will result in loss of federal funding or other sanctions, all UT System institutions and their employees are required to comply with federal and state laws and institution policies. Compliance with laws and policies is distinguishable from best practices, which provide suggested methods of compliance and implementation. It is important to confer with your institution's Provost, department heads or legal offices for any further issues or questions related to the use of online learning platforms.

1. Can a student refuse to participate in online class or provide their name or email address during an online class?

No, it is legal and reasonable to require a student to provide a name or email address for participation in an online class without resulting in a violation of law or policy. While students continue to maintain FERPA rights and protections while enrolled in online classes, students do not have the right to be "anonymous" whether classes are in person or online, or for online courses, live (synchronous) or recorded (asynchronous).

Even if a student has opted out of allowing release of their FERPA "directory information," this opt-out cannot be relied on to refuse providing a name, institutional email address, or other identifier in a course in which the student is enrolled. However, in instances involving specific concerns regarding personal safety, you are encouraged to confer with your institution's Title IX and/or Legal Affairs offices for guidance regarding possible solutions to address student concerns. Additionally, students with accommodations may have specific technological requests. In those instances, contact your institution's office for student disability services and accommodations and/or legal affairs to ensure access to online learning tools and to avoid creating barriers for students requiring accommodations.

2. Can I reuse a course recording from a prior course (including a live synchronous course) or save a course recording to use in a future course? Can I give access to class recordings to non-students or students not enrolled in the class? Can non-students or students not enrolled in a class observe a live online course?

Provided you follow FERPA and institution policies it is not unlawful to reuse a course recording in a future course, give access to course recording to individuals not enrolled in the course, or to allow individual not enrolled in the course to observe a live online class. To use course recordings

in future courses, you must determine whether course recordings contain student personally identifiable information. Course recordings that do not contain student personally identifiable information may be re-used in a future course offering without obtaining consent or editing the recording. To the extent recordings contain student personally identifying information, you must obtain consent or ensure recordings are de-identified prior to use. Additional requirements for the ongoing use of a previously recorded course or the outside use of a recorded course may be required by your institution. Please work with your Provost or legal affairs department.

Non-students or students not enrolled in a course can be given access to class recordings only if the recording does not contain student personally identifiable information or all students whose personally identifiable information or other education records are captured in a recording have provided appropriate consent. To the extent you would like to allow a non-student or student not enrolled in a class to observe a synchronous online course, please follow your institution guidelines regarding course observation, which may necessitate student consent if student personally identifiable information, including student interaction, may be observed during the class.

For courses in which student participation is not integral to the learning experience, instructors could plan courses such that only instructor lecture portions of the course are recorded. To the extent a recording is only from the perspective of the host (course instructor), provided student names or other identifiers are not visible in the chat or other functions, the recording is unlikely to contain information protected by FERPA. Depending on the course platform and technological capabilities, course recordings may also be edited to omit or de-identify students participating during the synchronous course. Please note recordings of student voices are considered personally identifiable information under FERPA, so image blurring and voice alteration may be required to de-identify a recording without completely removing student participation portions of the recording. Students could also be given notice that the recording may be used in future courses or otherwise posted publicly to allow them to edit their screennames after attendance is taken but prior to the start of recording so that they are not identifiable in the video recording and/or to load an unidentifiable image/background so they are not identifiable in the video recording. Many of the options may be dependent on the technology being used. To the extent you wish to ensure use outside the current course, you may consider recording the reusable portion of course material outside of the class session to eliminate the risk of students being identified and avoid the necessity for consent and/or editing.

Institutions may have specific FERPA consent forms for course recordings, which might be built into an online platform. FERPA requires specific consent language, so a non-FERPA specific release in software (such as one TEAMS may utilize) is unlikely to satisfy the legal requirements for release. If your institution or department does not have a specific FERPA recording consent form or built-in platform for collecting the consent forms, your department or institution legal affairs office can assist in providing you with a consent form that students can download and submit electronically.

3. What requirements should be considered for recording and posting recordings of online classes?

If the recording of a class does not disclose student personally identifiable information, FERPA does not prohibit recording the live course for use by other students regardless of if they are enrolled in the course. If the recording does contain personally identifiable information from student education records, such as identifiable students asking or answering questions or giving presentations, FERPA does not prohibit making the recording available to other students enrolled in the same course, but best practice would be to provide notice to the students, such as a statement on the course syllabus. Your legal affairs office may have preferred boilerplate language. Otherwise, a simple statement such as the one below may serve to put students on notice of possible recordings of the class. It is important to note that a statement such as the one below is a notice to students and should not be considered consent from the students.

Class sessions may be recorded by the instructor for use by students enrolled in this class. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the class and only for educational purposes. Course recordings should not be shared outside of the class in any form without express permission.

Generally, if the course recording simply includes the captured image of students as part of the background and does not make any particular student the focus of the recording, such a recording would not be considered directly related to a particular student and would therefore not be the student's education record. However, because FERPA is highly contextual and varies case by case, the best practice is to either exclude students identifying information from course recordings or obtain consent from all students enrolled in the course. Obtaining consent may seem daunting for larger courses; therefore, consider providing an affirmative consent statement at the time of providing the course syllabus or at the time of enrollment for the course.

Controlling the transmission and distribution of video recorded classes may also provide compliance with FERPA and prevent unauthorized access to courses. It is recommended that faculty and staff communicate with the institution's IT or information security department for additional resources and trainings on the functionality of online course technology. Some online course platforms allow posting of course recordings for streaming access only without the capability of downloading, which can help provide technological control of the online course. Such tools and functionality may include the ability to add closed captioning or allow students to produce human-based captioning of course lecture recordings. Your institution's office for student disability services and accommodations can assist with these tools and situations.

4. Some students have expressed concern about the invasiveness of live proctoring. What should I tell them?

Live proctoring is not unlawful. Institutions may have various technological options for live proctoring of tests and exams, including Proctorio (no live observation), Respondus Monitor, or

ProctorU. Some students have expressed specific concerns regarding religious beliefs about photographs and recordings or may require additional testing accommodations for disabilities; such questions should be directed to your institution's office for student disability services and accommodations. Your institution or department most likely has required or suggested language to include on your syllabus depending on the live proctoring services utilized. To the extent your institution or department does not have suggested language, a general notice may look something like:

NOTICE: Your enrollment in this course requires the use of [program name] for online assessment proctoring. [description of the tool – electronic test proctoring via webcam and other tools without live review by a person, live video and other monitoring, and/or lockdown browser]. **YOUR ACTIVITIES ARE RECORDED WHILE YOU ARE LOGGED INTO OR TAKING YOUR ASSESSMENT(S). THE RECORDINGS SERVE AS A PROCTOR AND WILL BE REVIEWED AND USED IN AN EFFORT TO MAINTAIN ACADEMIC INTEGRITY.** You can find more detailed information on [program name] at [institution or department website regarding the tools].

- 5. Some students don't have webcams, and for that reason, institutions have developed alternative methods for live proctoring, including using students' cell phone camera to record/stream their test taking. Is this allowed? Are there any best practices for handling these one-off approaches?**

It is not unlawful to allow alternatives to your institution's usual methods of live proctoring, including use of a student's cell phone camera. Where students do not have a webcam or have poor internet connectivity, use of a cell phone camera to record and/or stream test taking is a viable work-around. Consult with your department and available institution resources to ensure compliance with institution policies and to address specific student requests for alternatives to live proctoring. Encourage students to log onto the online testing platform at least 30 minutes prior to an exam to ensure there are no technology issues. Teaching Assistants or department administrative staff can assist instructors with checking access to online tests at least 24 hours in advance to allow time to address any issues with instructor or institution technology. Instruct students to contact you in advance of tests if they anticipate needing an alternative to live proctoring. Additionally, because technology issues are often unplanned, communicate any alternatives with students before-hand and consider being available or having a Teaching Assistant or other employee available for contact during the scheduled test window. Having a plan for acceptable alternatives or an alternative time for students who encounter technological issues and communicating these resources to students can help provide clarity on how to address problems. Your department and institution may have existing guidance and procedures for these situations.

- 6. Can I require a student to show his or her webcam during a live online course?**

It is not unlawful to require a student to show his or her webcam during a live online course. Generally, we do not suggest requiring students to use their webcam during synchronous online courses. A better approach is to give students the option to use their webcam or to upload an avatar where the lecturer and/or other students can view participants. However, some specific

departments or courses may require use of a webcam during live online courses. If a course requires the use of a webcam, prior to the start of the course and within the syllabus you should provide notice of the requirement and links to resources such as institution IT departments and student emergency fund webpages to enable students without such tools to prepare for the course requirements.

7. If I do not require students to show their webcam, how will I take attendance for class participation?

Some institutions have recommended for courses in which flexibility is possible, instructors reconsider “attendance” as including asynchronous learning involving the viewing of course recordings and materials outside of regularly scheduled course times as necessary. Answering quizzes or submitting comments regarding recorded lectures and posted materials could be used to constitute “attendance.”

For courses requiring “attendance” during synchronous classes, instructors can utilize a platform’s chat function to require students to “check in” and/or answer questions during the class. Additionally, some online learning platforms create log-on rosters and other data instructors can utilize to confirm attendance. For evaluation of participation in class, similar tools to those used during in-person classes can be adapted to the online format, including quizzes, discussion groups, student presentations, and questions and answers. Your institution likely provides resources to assist with the transition to online teaching. Your department or the Office of the Provost may assist you identifying resources.

8. What if a student discloses sensitive or protected information during a synchronous course that is being recorded and posted for later viewing? Do I need to edit this information out before posting it?

Students sometimes share sensitive or otherwise confidential information during class discussions. Where the recording will be available only to other students enrolled in the course, this information does not need to be edited before posting. Housing recorded lectures within a protected Learning Management System (“LMS”) environment will assist in protecting the sensitive information. To the extent you feel this information does not add to the course or you prefer to remove the disclosure as a courtesy or at the request of the student, editing the portion out of the lecture or de-identifying the student’s image and voice can help protect the student’s privacy.

9. Can I post a video of a class to my own or another non-institution website?

Some institutions may allow this with approval and compliance with Intellectual Property guidelines and other policies. However, please note that as with sharing recordings containing student personally identifiable information with anyone not enrolled in the current course at issue, any student whose personally identifiable information or other education records are contained in the recording must either provide appropriate consent or the recording must be edited to omit or de-identify the student, as discussed above.

OTHER FERPA ISSUES & BEST PRACTICES

Privacy issues that apply to in-person classes also apply to online learning, including:

- Ensuring grades are not posted publicly or for all students to access if identified by name, ID number, or other linkable information.
- Use of student personally identifiable information on personal devices, at home in hard copy, or on University equipment at home must comply with policies and procedures to protect personally identifiable information.
- Sharing of student personally identifiable information or other Education Records must be for official University purposes or other exceptions to disclosure, unless a student provides valid consent in accordance with FERPA.
- FERPA does not have specific security or technical requirements for use of apps or software, but institutions and UT System have policies regarding best security practices and requirements. Check with institution information security offices and/or department IT contacts to ensure the product you want to use is approved or meets policy requirements.
- If sharing your screen or recording a course lecture, consider logging out of your email and/or disabling email alerts to ensure no confidential or personal information is visible to students.