

# Syllabus

## Course Information

Course Number: CSCE 313  
Course Title: Introduction to Computer Systems  
Section: 513 - 516  
Time / Location: Class: asynchronous online (activities are on TR)  
Labs: Section 513: TR 9:45am – 10:35am / ZACH 442  
Section 514: TR 11:30am – 12:20pm / ZACH 442  
Section 515: TR 1:30pm - 2:20pm / ZACH 442  
Section 516: TR 3:15pm – 4:05pm / ZACH 315  
Credit Hours: 4

## Instructor Details

Instructor: Riccardo Bettati  
Office: online  
E-Mail: [bettati@tamu.edu](mailto:bettati@tamu.edu)  
Office Hours: F 10am – 12pm on Zoom (link is provided in weekly activities on eCampus)

## Course Description

The objective of this course is to provide you with a general understanding of what system software is involved for an application program to run, both on a single node and over a network, and how this system software is to be used. In support of this, the course will prepare you to do system-level and network programming. This course will teach you how to “use” (as opposed to “design”) system components, such as memory, file systems, process control, interprocess communication, and networking. By the end of this course you will understand the problems and pitfalls typically encountered in the design and implementation of multithreaded and networked applications and systems. More specifically, by the end of this course you will be proficient at making full use of the services provided by the underlying operating system by programming directly at the operating system interface level, POSIX over UNIX in our case.

## Course Prerequisites

A course in Computer Organization or Computer Architecture (CSCE 312 or ECEN 350).

## Course Learning Outcomes

At the end of this course you will understand the following aspects of a computer system, in no particular order:

- Execution of a program; function calls; interrupts.
- What is an operating system; what are its components; why system calls; etc.
- The OS application interface; file system; memory control; process control; etc.
- Concurrency, process synchronization, interprocess communication

- Network Programming; Berkeley sockets; RPC; pitfalls in networks.
- Security threats in centralized and distributed systems; authentication, authorization, confidentiality; security mechanisms. Passwords and their management.
- Overview of system programming in Windows.

## Textbook and/or Resource Materials

The **primary textbook** for this course is

- Advanced Programming in the UNIX Environment, 3/E , by W. Richard Stevens and Stephen A. Rago. Addison Wesley Professional. 2013.

There are a few sections of the course that are not covered well by the Stevens book, so if you don't feel comfortable with the material as presented in class we are **recommending** a **secondary textbook**, which is

- Operating System Concepts 9th edition or 10th edition, by Silberschatz, Galvin, Gagne, John Wiley & Sons, Inc., New York, 2012, ISBN-13: 978-1118063330.

For the secondary textbook, any recent edition will be fine, and early editions are much cheaper.

Reading assignments in the course will use the chapter numbering from the 9th and 10th edition. If you use an earlier textbook, you will have to map the chapters to your edition.

## Other Interesting Reading

Systems Programming

- Understanding Unix/Linux Programming; A Guide to Theory and Practice, by Bruce Molay. Prentice Hall, 2003.
- Advanced UNIX Programming, by Marc J. Rochkind, (Addison-Wesley Professional Computing Series) Computer Systems
- Computer Systems: A Programmer's Perspective, by Randal E. Bryant and David R. O'Hallaron

Operating Systems

- (hands-on) Operating Systems, Operating Systems, A Modern Perspective, by Gary Nutt (Addison Wesley)
- (not-so hands-on) Modern Operating Systems A.S. Tanenbaum (Prentice Hall)

These optional books complement the textbook. Perusing them may help you better understand some issues discussed in class.

## Grading Policy

The course will have a **midterm** (200 points) and a **final exam** (200 points). In addition, there will be a series of design and programming assignments (**machine problems**) that will give the student practical experience with system programming concepts ranging from memory management, to synchronization, to network programming (400 points). Finally, there will be a set of **on-line quizzes** (50 points) and a set of **homework assignments** (150 points).

The course will be using a standard letter grading scale:

Standard Letter Grading Scale:

A = 90-100%

B = 80-89%

C = 70-79%  
D = 60-69%  
F = less than 60%

## Submissions of Assignments

Homework assignments and machine problems will be posted and submitted on eCampus. It is the student's responsibility to make sure that the correct assignment is submitted to the correct place. Also, eCampus submissions may look completed when they actually are not. It is the student's responsibility to make sure that the submission process is completed. It is best to download the submission and to confirm that the submission stored on eCampus is the intended one.

The instructor and the TA's will not consider non-submitted material, and they will not consider the file timestamps (as opposed to submission timestamps) as indication of completion of the assignment. (Time stamps of files can be easily tampered with and will therefore not be considered.)

## Late Work Policy

Deadlines for on-line quizzes and homework assignments will be hard. Late submissions will not be accepted. Unless noted otherwise, lateness for machine problems is penalized with 1/5 of the earned points per calendar day (1/3 during 10-week summer courses). Lateness penalty starts at the deadline and is pro-rated. This means that the student will incur a penalty of approximately 0.0139 percent for each minute that their submission is late (0.0231 percent during 10-week summer courses). **No make-up work submissions will be accepted.**

## Course Schedule

Week	Day	Topic	HWs	MPs
1	Thurs	Introduction, What is an OS?		<b>NO LAB</b>
2	Tues	Arch Support, OS Structure		MP1 out
	Thurs	System Calls	HW1 out	MP2 S1 due
3	Tues	Programs, Processes, and Threads		
	Thurs	Scheduling		MP1 S2 due
4	Tues	POSIX Threads		
	Thurs	Synchronization: Introduction	HW2 out	MP1 S3 due
5	Tues	Critical Sections: SW Solutions		MP2 out
	Thurs	Critical Sections: HS Solutions		
6	Tues	Semaphores		
	Thurs	Monitors	HW3 out	MP2 due
7	Tues	Signals		MP3 out
	Thurs	Time and Timers		
8	Tues	<b>MIDTERM EXAM</b>		<b>8:00 – 10:00 a.m.</b>
	Thurs	UNIX IO	HW4 out	
9	Tues	Persistent Files		
	Thurs	File Names		MP3 due
10	Tues	Multiplexing IO		MP4 out
	Thurs	Multiplexing IO: Case Study	HW5 out	

11	Tues	UNIX Special Files		
	Thurs	Interprocess Communication (IPC)		
12	Tues	Network Programming: Intro		
	Thurs	The Socket API	HW6 out	MP4 due
13	Tues	Server Design		MP5 out
	Thurs	Security: Introduction and Encryption		
14	Tues	Security: Authentication		
	Thurs	Windows System Programming		
15	Tues	TBD (open)		
	Thurs	<b>Thanksgiving</b>		
16	Thurs	<b>Final Exam</b>	<b>Thursday, Dec 3</b>	<b>8:00 – 10:30 a.m.</b>

**Homeworks** are posted on Friday and are due the next Friday. **Machine Problems** are posted on Monday morning and are due on Sunday night of the week they are due. For details, check the “Activities” pages on eCampus.

## University Policies

### Attendance Policy

**Classroom:** The **class work** for this course will be delivered **completely on-line**, and students are not required to be present on campus. Students will study **on-line learning modules** on eCampus and regularly submit assignments to demonstrate mastery of the material.

**Labs:** Participation in labs is required. Students will have the opportunity to attend the labs in person or online.

**Exams:** (midterm and final) will be held on-line, using a proctoring service. Details will be made available on eCampus.

Exams are scheduled at the beginning of the semester, and make-up exams are given only in extraordinary circumstances. Two such cases are:

**Medical:** If a student cannot take an exam because of medical reasons, a doctor’s note is required in order to schedule a make-up exam.

**Mandatory Interviews:** If a student has to schedule a makeup exam because of a “mandatory” interview for employment or professional or graduate school, she or he has to submit a written note from the organizer of the interview stating that the interview is in fact mandatory and cannot be held at a different time. This note must be submitted to the instructor at least 2 weeks before the interview, and it must contain the contact information, including email and telephone number, of the person responsible for the interview. The instructor will then contact the organizer and confirm that the interview cannot be rescheduled.

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

## Incompletes

Students should be reminded about what Rule 10 (Grading) of the TAMU Student Rules states about “Incompletes”: *“A temporary grade of I (incomplete) at the end of a semester or summer term indicates that the student has completed the course with the exception of a major quiz, final examination, or single major assignment. **The instructor shall give this grade only when the deficiency is due to an approved university excused absence** (see Rule 7 of TAMU Student Rules) or based on criteria published in the Law School Handbook.”* This rule will be strictly followed in this class.

## Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student’s grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor” ([Student Rule 7, Section 7.4.1](#)).

“The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence” ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

## Academic Integrity Statement and Policy

“An Aggie does not lie, cheat or steal, or tolerate those who do.”

You are encouraged to discuss solution approaches to programming assignments. The solution that you hand in has to be your own, however. This means that you are not to use any part (code, text, figures, etc.) that has been developed by others. Spelled out, this means:

- For programming assignments: Do not show or make available in any form to other students either design documents or code. Do not look at or use other students’ design documents or code. Do not make use of previous years’ solutions. Do not look at or download solutions from the Internet.
- For homework: Do not make your homework available to other students. Do not copy from other students’ work. Do not look at or download solutions from the Internet.
- For exams: Do not use any information from other students. Do not pass any information to other students. By information we mean any information, not even the time-of-day.

How do we determine that plagiarism has happened? We will delegate our decisions to code-similarity detection tools and automated plagiarism detection tools. Whenever a tool flags your submission, we will treat it as a potential violation, and we will issue a report to the Aggie Honor System Office. So, to be safe, stay away from other students' code and other solutions that are not your own!

Once an alleged violation has been reported, it is Aggie Honor Systems Office policy to not allow the student to Q-drop the course until the student is cleared of the violation.

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at [aggiehonor.tamu.edu](http://aggiehonor.tamu.edu).

## Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit [disability.tamu.edu](http://disability.tamu.edu). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

## Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a

formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

## Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at [suicidepreventionlifeline.org](https://suicidepreventionlifeline.org).

## COVID-19 Specific Requirements and Measures

### *Campus Safety Measures*

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, Texas A&M University has adopted policies and practices for the Fall 2020 academic term to limit virus transmission. Students must observe the following practices while participating in face-to-face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- Self-monitoring—Students should follow CDC recommendations for self-monitoring. **Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely and should not participate in face-to-face instruction.**
- Face Coverings—[Face coverings](#) (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain. Description of face coverings and additional guidance are provided in the [Face Covering policy](#) and [Frequently Asked Questions \(FAQ\)](#) available on the [Provost website](#).
- Physical Distancing—Physical distancing must be maintained between students, instructors, and others in course and course-related activities.
- Classroom Ingress/Egress—Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Leave classrooms promptly after course activities have concluded. Do not congregate in hallways and maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.
- To attend a face-to-face class, students must wear a face covering (or a face shield if they have an exemption letter). If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class remotely. If the student does not leave the class, the faculty

member should report that student to the [Student Conduct office](#) for sanctions. Additionally, the faculty member may choose to teach that day's class remotely for all students.

### *Personal Illness and Quarantine*

Students required to quarantine must participate in courses and course-related activities remotely and **must not attend face-to-face course activities**. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities.

Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence (See [Student Rule 7, Section 7.2.2.](#)) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7. While Student Rule 7, Section 7.3.2.1, indicates a medical confirmation note from the student's medical provider is preferred, **for Fall 2020 only, students may use the Explanatory Statement for Absence from Class form in lieu of a medical confirmation. Students must submit the Explanatory Statement for Absence from Class within two business days after the last date of absence.**

### *Operational Details for Fall 2020 Courses*

For additional information, please review the [FAQ](#) on Fall 2020 courses at Texas A&M University.