



TEXAS A&M UNIVERSITY  
**SAN ANTONIO**

CSCI 3344:001, **Computer Architecture**, Spring 2025, CRN: 22796  
Department of Computing and Cyber Security, College of Arts and Sciences  
**Course Syllabus**

**Class Meeting Time and Place:** TR 11:00 AM - 12:15 PM, STEM 143  
**Class Duration:** 01/21 - 05/13  
**Instructor:** Mr. Brandon Earwood,  
Office: STEM 211L  
Tel: 210-784-2382  
E-Mail: Brandon.Earwood@tamusa.edu  
Student emails will receive a reply  
within two business days.

**Course Website:** <https://tamusa.blackboard.com/>

**Office Hours:** MTW 3:30 PM – 5:30 PM, STEM 211,  
F 1:00 PM – 3:00 PM, through Zoom,  
and by appointment through email.

**Catalog Course Description:** This course introduces Basic Processor Design; Performance Evaluation; Pipelining; Memory Hierarchies; Caches, Virtual Memory; Input/output and Storage; Introduction to Instruction Level Parallelism. *Prerequisites:* CSCI 2325.

**Course Objectives:** Students will learn how to design and evaluate the performance of computer processors, including pipelining versus sequential processing, the hierarchies of memory from caches up to external memory and the role of virtual memory in these hierarchies, and input/output devices as well as bus interconnections. Instruction level parallelism and superscalar processors are also briefly introduced.

**Prerequisites:** CSCI 2325. Students who do not meet the prerequisites must contact the instructor immediately.

**ABET Assessment:** The Department of Computing and Cyber Security is in the process of applying for ABET accreditation for the Bachelors program in Computer Science. As part of that process, students will be assessed on course and program level outcomes based on various courses. The materials from this course may be used for assessing such program level outcomes, and hence students are required to follow appropriate guidelines for submission of coursework, as well as the necessary rigor to ensure mastery and retention of the course outcomes. More specifically, the ABET outcomes measured for the course are:

**Student Outcomes:** Graduates of the program will have an ability to:

2. Design, implement, and evaluate a computing-based solution to meet a given set of computing

requirements in the context of the program's discipline.

After successful completion of this course, students will be able to:

- Evaluate the performance of computer processors
- Understand and evaluate hierarchies of memory, including trade-offs between different memory technologies
- Understand input/output devices and bus interconnections
- Design computer instruction sets using the assembly language
- Design and implement a computer based on processor performance, hierarchies of memory, input/output devices, and bus interconnections

**Required Materials:**

- **Textbook:** Computer Organization and Architecture, 11th edition, Pearson by William Stallings, ISBN: 9780135160930.
- **Blackboard:** Connect to <http://tamusa.blackboard.com>. You will have lecture notes, solutions to problems, multimedia materials and other supplementary materials in Blackboard. All class communications will be through Blackboard and students should monitor this several times a day.
- **Computer Hardware:** In order to participate in the tutoring sessions you will need a computer with an internet connection, a microphone and speakers/headphones.
- **Time Expectations for coursework:** You are expected to spend 3-6 hours per week for the course. Based on the background, some students may require more time. Time spent may be longer when assignment/exams are due.

**Other Recommended / Reading Materials:** Additional reading materials are available on the course website as recommended by the instructor.

***Course Requirements every student must fulfill in order to succeed in course:***

1. Students should check the Course Calendar, Announcements, and Messages (e-mail) systems in Blackboard on a regular basis.
2. Students should keep current with all course assignments, quizzes, and examinations.
3. If the course uses remote proctoring for exams, students must schedule their exam early in the semester.
4. Students should ask questions and communicate with the instructor either in class, online, off-line or during office hours.
5. For all classwork, exams, quizzes etc., if a student is completing it off-campus, then they are responsible for the availability of internet connectivity. Extensions will **not** be granted for lack of availability of internet connections.

**Grading Policy:** The final course grade will be based on your performance on the quizzes, exams, assignments and class participation using the following weights:

Assignments	30%
Semester Project	20%
Exam 1 (15%) + Exam 2 (15%)	30%
Final Exam	20%

Total

100%

The final letter grades will be assigned as follows: Above 90%  $\Rightarrow$  A; 80 – 89%  $\Rightarrow$  B; 70 – 79%  $\Rightarrow$  C; 60 – 69%  $\Rightarrow$  D; Below 60%  $\Rightarrow$  F.

This course has a requirement of a grade of C as a minimal grade for satisfactory completion of this course.

**Examinations and Quizzes:** There will be two mandatory mid-term exams and a mandatory final exam (as per university schedule). Being absent for an exam will result in a grade of zero for that exam and may result in a fail grade in the course. The exams/quizzes will consist of conceptual multiple-choice questions, problem solving questions, and short essay questions. The exam/quiz materials will come from lecture notes, the textbook, and class discussions. Questions will emphasize understanding and applications of concepts and topics covered in class.

**Proctored Exams:** In order to ensure course integrity, students enrolled in this course may use a Remote test-Proctoring software for the administration of exams, if allowed and is set up by the instructor.

The College of Business has partnered with ProctorU for the Remote test-Proctoring service. It is completely free for students to use; there is no additional fee to students for using this service. Students are required to make their own appointment to take exams within the timeframe established by your professor. If you make an appointment for an exam and fail to appear, subsequent testing attempts for that exam will incur a fee to the student of about \$30 (prices are dependent on the length of the exam). Information about required computer equipment needed for this service can be found on the ProctorU website. At a minimum, students need a computer, webcam, a microphone, and an internet connection with at least 3 MPS upload and download speed. Information and FAQs about how to register and take your exam with ProctorU is available on their website at ProctorU.com. You can also test your computer systems readiness at that site.

**Assignments/ Research papers:** There will be several assignments and projects (individual/team of two) during the course. Individual assignment statements and due dates will be posted through Blackboard. For all assignments and quiz problems, ALL intermediate work of the problem solution steps MUST be shown. Considerable points will be taken off for not following these requirements. As a general rule, name the assignment/lab submissions as: *assignmentName\_firstname\_lastname*.

**Make up and Late Assignment/exam/quiz policy:** As a general rule, make-ups or late submissions will NOT be offered or accepted for any missed exams. Late submissions or make-ups for exams may be accepted/administered only in extraordinary circumstances such as an excused official university activity, a severe illness, or a dire emergency. However, you must provide comprehensive documentation either before or within a few days of the missed exam.

All assignments, labs, and projects have a clearly indicated due date and will receive full credit only if they are turned in by the due date. **All assignments are due at 11:59 pm on their due date.** In case of late assignment being approved by the instructor, the late penalty for assignments, labs, and projects applies as follows.

All assignments, labs, and projects that are late up to 1 week lose 10% of the maximum grade, 1 week to 2 weeks 20% of the maximum, and 2 weeks to 3 weeks lose 30% of the maximum. Assignments, labs, and projects more than 3 weeks late will not be accepted.

**Class conduct and civility code:** Everyone in class is expected to follow all rules in the student handbook, as well as common courtesy during classroom lectures and discussions in class and online, including the following:

1. Attendance may be taken at the beginning or the end of the class.
2. It is the students' responsibility to obtain and be able to use the required materials and software for this class.
3. Student must retain copies of all assignments and graded work for verification purposes and provide it to the instructor, if necessary. Keep own copies of all computer files and e-mails till final grade is received.
4. Talking while the instructor is lecturing is extremely disruptive and discourteous to the instructor and other students.
5. Using computers or phones (except for a valid urgent need) during class for a purpose not related to class is disruptive. All cell phones and gadgets should be turned OFF and headphones removed.
6. For any questions about the exams and assignments, a student should contact the instructor, well in advance of the day they are due, so the instructor may have enough time to provide feedback.
7. All communications will be via e-mail communications to the Texas A&M University e-mail account, and students are expected to use their school provided email account. The instructor will reply to a student e-mail messages and voice messages within 2 business days (Monday-Friday).
8. All assignment submissions must be uploaded to Blackboard by the due date and time. Submission window may close or marked late, even if late by one second.

Anyone violating these policies may be subject to disciplinary actions.

**Class attendance and Participation:** A vital part of every student's education is regular attendance of class meetings. Any absences tend to lower the quality of a student's work, and frequent or persistent absences may result in a failing grade. Students are responsible for the materials covered in class. The course covers a lot of material and most students find at least some parts of it difficult. Class participation is highly encouraged as it makes the class more interesting and enhances the learning experience. Students are strongly encouraged to ask questions, participate in class discussions and problem solving, and visit/contact the instructor during office hours in case of questions or concerns. Good attendance and participation will be rewarded when final grades are assigned.

The course is intensive and challenging and you are expected to master the materials presented in class. The structure of the class makes your individual study and preparation outside of class extremely important, and may vary considerably based on student background. However, a **minimum** of two hours of work outside the class is expected for every one hour of class period per week. Reading the assigned chapter(s) and having some familiarity with them before class will be very useful for understanding lectures.

### ***Spring 2025 CSCI 3344:001 Class Schedule***

The provisions and information set forth in the schedule below are intended to be informational and not

contractual in nature. The instructor reserves the right to amend, alter, change, delete or modify the provisions of the schedule.

<i>Week</i>	<i>Dates</i>	<i>Chapter and Topic</i>	
1	Jan 21 – Jan 24	Jan 15 (Monday) MLK Day Univ Closed Syllabus, Chapter 1. Basic Concepts and Computer Evolution	
2	Jan 27 – Jan 31	Chapter 1. Basic Concepts and Computer Evolution Chapter 2. Performance Concepts	
3	Feb 3 – Feb 7	Chapter 2. Performance Concepts	
4	Feb 10 – Feb 14	Chapter 3. A Top-Level View of Computer Function and Interconnection	
5	Feb 17 – Feb 21	Chapter 3. A Top-Level View of Computer Function and Interconnection Chapter 4. The Memory Hierarchy: Locality and Performance	
6	Feb 24 – Feb 28	Chapter 4. The Memory Hierarchy: Locality and Performance	<b>Exam 1</b>
7	Mar 3 – Mar 7	Chapter 5. Cache Memory	
8	Mar 10 – Mar 14	Spring Break	<b>Univ Closed Mar 10-15</b>
9	Mar 17 – Mar 21	Chapter 5. Cache Memory Chapter 6. Internal Memory	
10	Mar 24 – Mar 28	Chapter 6. Internal Memory	
11	Mar 31 – Apr 4	Chapter 7. External Memory	
12	Apr 7 – Apr 11	Semester Project Begins Chapter 7. External Memory Chapter 9. Operating System Support	
13	Apr 14 – Apr 18	Chapter 9. Operating System Support	
14	Apr 21 – Apr 25	Chapter 15. Assembly Language and Related Topics	<b>Exam 2</b>
15	Apr 28 – May 2	Chapter 16. Processor Structure and Function	
16	May 5 – May 13	<b>Study Day May 6</b> – Classes do NOT meet. <b>Final Exams May 7-13</b> – As per University Schedule	<b>May 5 – Last day of classes</b> <b>May 6 – Nothing due</b> <b>Final Exams must be held only as per Univ Schedule</b>

**University Email Policy and Course Communications:** All correspondence between professors and students must occur via tamusa email accounts. You must have your Jaguar email account ready and working. If it is not working, contact the help desk at 210-784-4357.

**Academic Accommodations for Persons with Disabilities:** The Americans with Disabilities Act Amendments Act (ADAAA) of 2008 and the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights protection for persons with disabilities. Title II of the ADAAA and Section 504 of the Rehabilitation Act requires that students with disabilities be guaranteed equal access to the learning environment through the provision of reasonable and appropriate accommodation of their disability. If you have a diagnosed disability that may require an

accommodation, please contact Disability Support Services (DSS) for the coordination of services. DSS is located at the Main Campus on the 2nd floor of the Central Academic Building in suite 210. The phone number for DSS is (210) 784-1335 and email is [dsupport@tamusa.edu](mailto:dsupport@tamusa.edu).

**Academic Learning Center:** All currently enrolled students at Texas A&M University-San Antonio can utilize the Academic Learning Center for subject-area tutoring. The Academic Learning Center is an appointment based center where appointments are made through the Navigate platform. Students access Navigate through Jagwire in the Student Services tab. The Center is active on campus outreaching to students to highlight services offered. You can contact the Academic Learning Center by emailing [tutoring@tamusa.tamus.edu](mailto:tutoring@tamusa.tamus.edu) or calling (210)-784-1332. Appointments can also be made through JagWire under the services tab.

**Counseling Resources:** As a college student, there may be a time when personal stressors interfere with your academic performance and/or negatively impact your daily functioning. If you or someone you know is experiencing life stressors, emotional difficulties, or mental health concerns at A&M-SA, please contact the Office of Student Counseling & Wellness Services (SC & WS) located in Modular C Room 166 (Rear entrance) or call 210-784-1331 between the hours of 8:00 AM and 5:00 PM. All mental health services provided by SC & WS are free, confidential (as the law allows), and are not part of a student's academic or university record. SC&WS provides brief individual, couples, and group therapy, crisis intervention, consultation, case management, and prevention services. For more information, please visit [www.tamusa.edu/studentcounseling](http://www.tamusa.edu/studentcounseling).

In a crisis, please walk-in to the SC & WS services between 8:00 AM and 5:00 PM to be seen by a licensed clinician. After hours, please contact UPD at 911 or text "HOME" to 741-741 24/7/365 to connect with a trained crisis counselor. The National Suicide Prevention hotline also offers a 24/7/365 hotline at 1-800-273-8255.

**Emergency Preparedness:** JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email and/or phone call with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>.

More information about Emergency Preparedness and the Emergency Response Guide can be found here: <http://www.tamusa.edu/riskmanagement/index.html>.

**Financial Aid and Verification of Attendance:** According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended the first week of class. Any student receiving federal financial aid who does not attend the first week of class will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

**Jaguar Writing Center:** The Jaguar Writing Center provides writing assistance to graduate and undergraduate students in all three colleges. Writing tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Students can make individual or group appointments with a writing tutor. The Writing Center is located in the Central Academic Building, Suite 208. Appointments can also be made through JagWire under the services tab.

**Meeting Basic Needs:** Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Dean of Students (DOS@tamusa.edu) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources they may possess.

**Military Affairs:** Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance if possible, and special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the Patriots' Casa in-person room 202, or to contact the Office of Military Affairs with any questions at military@tamusa.edu or (210)784-1397.

**Religious Observances:** Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

**Respect for Diversity:** We understand that our students represent diverse backgrounds and perspectives. When we are equity-minded, we are aware of differences and inequalities and are willing to discuss them so we can act to resolve them. The University is committed to building cultural competencies, or the attitudes, skills, and knowledge that enable individuals and organizations to acknowledge cultural differences and incorporate these differences in working with people from diverse cultures. Respecting and accepting people different than you is vital to your success in the class, on campus, and as a future professional in the global community. While working together to build this community we ask all members to:

- Share their unique experiences, values, and beliefs.
- Be open to the views of others.
- Honor the uniqueness of their colleagues.
- Value each other's opinions and communicate respectfully.
- Keep confidential discussions that the community has of a personal (or professional) nature.
- Use this opportunity together to discuss ways in which we can create an inclusive environment in this course and across the A&M-San Antonio community.

**Drop Policy:** You may drop the course with an automatic grade of W on or before the date listed in the academic calendar at [www.tamusa.edu](http://www.tamusa.edu). The last date to drop a course, or withdraw from the University is also indicated in the academic calendar on the university website ([www.tamusa.edu](http://www.tamusa.edu)). If you wish to

drop the class, you must submit the necessary paperwork to the proper authority. Students dropping a course are subject to all conditions listed in the university catalog.

**The Six-Drop Rule:** Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

**Statement of Harassment and Discrimination:** Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equality of opportunity and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality, diversity, pluralism and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, or veteran status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

**Students' Rights and Responsibilities:** The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

#### *Students' Rights*

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of University Student Rules shall be assured a fundamentally fair process.

#### *Students' Responsibilities*

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty and University officials.
2. A student has the responsibility to be fully acquainted with the published University Student Rules and to comply with them, as well as federal, state, and local laws.



3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to maintain a level of behavior that is consistent in supporting the learning environment of the institution and to recognize the University's obligation to provide an environment for learning.

**Violations of Academic Conduct (Section 14.5 Student Handbook):** As a member in an academic community, students at Texas A&M University-San Antonio are expected to exhibit a high level of honesty and integrity in their pursuit of higher education, be mature, be self-directed and be able to manage their own affairs. Students who are unwilling to abide by these basic expectations will find themselves facing academic and/or disciplinary sanctions. Students are expected to share in the responsibility and authority with faculty and staff to challenge and make known acts that violate the Texas A&M University-San Antonio Code of Conduct. For more information please visit the Office of Student Rights & Responsibilities website <http://bit.ly/TAMUSAStudentRR>.

Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered academic misconduct. Academic misconduct includes, but is not limited to, cheating, plagiarism, multiple submissions, collusion, lying and bribery. For more information, refer to the Student Code of Conduct, Article III: Conduct Rules and Regulations. Texas A&M University-San Antonio faculty has the discretion to impose grade penalties as deemed necessary.

Faculty members are required to report such serious breaches of academic honesty to their chair, their dean and the Office of Student Rights and Responsibilities. In cases of academic misconduct, students may be subject not only to grade sanctions in courses but to disciplinary action. Grade sanctions may be imposed only by faculty members, but suspension or expulsion may be imposed only by the Vice President for Student Affairs. If a student wishes to appeal the decision of suspension or expulsion due to violations of academic misconduct, they must initiate their appeal as outlined within the Student Code of Conduct. Extenuating circumstances may cause the University to deviate from the defined time frames.

All student term papers and other written assignments are subject to analysis by anti-plagiarism software. Posting of any class work given to students, or solutions, or discussion, on publicly accessible forums or on social media is not permissible.

Considering the potential consequences of academic misconduct, it is obviously in students' best interests to avoid even the appearance of such behavior. If a student is unclear whether a specific act might constitute academic misconduct, please she/he should contact the instructor for an assessment of the situation.

### **Key Dates for Spring 2025 Semester**

The complete academic calendar is available online:

<https://www.tamusa.edu/academics/documents/ay-2025-calendar-09-19-2023.pdf>

Oct 21	Mon	Registration opens
Dec 23-Jan 1	Mon-Wed	Winter Break
Jan 14	Tue	Tuition & fee payment deadline
Jan 16	Thu	Drop for non-payment
Jan 17	Fri	Last day for students withdrawing to receive 100% refund (0% responsibility) for tuition
Jan 20	Mon	Martin Luther King, Jr. Day - No classes
Jan 21	Tue	First class day
Jan 28	Tue	Last day to register
Feb 5	Wed	Census Date
Feb 6	Thu	Drop for non-payment
Feb 24-Mar 7	Mon-Fri	Midterm grading period
Mar 10-Mar 15	Mon-Sat	Spring Break
Apr 18	Fri	Study day - No classes
Apr 21	Mon	Last day to drop with an automatic grade of "W"
Apr 28	Mon	Last day to withdraw from the university
May 5	Mon	Last day of scheduled classes for weekday classes
May 6	Tue	Study day - No classes
May 7-May 13	Wed-Tue	Final examinations
May 13	Tue	End of term
May 16	Fri	All grades due by noon
May 19	Mon	Grades available in JagWire
May 20	Tue	Commencement