Electrical and Computer Engineering 356
University of Tennessee, Knoxville

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University of Tennessee, Knoxville

https://tiny.utk.edu/canvas_ece356
Course Section: 1
Course Credit Hours: 3

Faculty Contact Information

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Welcome to ECE356

Hello students! This course is designed to be a practical learning experience with computer architecture.

This course is challenging because you will need to take rather complex topics and apply them to your labs. I will have lectures, lecture slides, videos, and tutorials to help you better understand the material. But, if those don't cut it, please don't hesitate to attend office hours.

Procrastination will be detrimental to your learning in this course. There are a lot of moving parts, and as some students have described it, a "treasure hunt". You will need to bring information from many sources to complete a task.

Instructor Availability

All office hours and times have been posted to Canvas. Please make sure you check these times before attending office hours as they may change from time to time.

I do ask that you please read all labs and lecture materials fully. Be forewarned, I may copy and paste a screenshot of the syllabus if you ask a question that is answered by the syllabus or other materials. I do this to make it a learning experience. I came from the US Air Force where we had thousands of pages of technical documentation and regulations. We were taught that we won't retain all the information in memory but knowing where to look for information is the important part.

With that being said, please do not hesitate to ask questions. The newness of everything may be overwhelming at first. I'm hoping that as the course progresses, you'll be confident to make decisions about your code and know where to go for guidance.

COURSE DESCRIPTION

Architecture and design of microcomputer systems with microprocessors or microcontrollers. Instruction set architectures, software interfaces, processor structures, memory hierarchy, and interfacing. Includes laboratory work.

Student Learning Outcomes/Objectives

Students who successfully complete this course can expect to learn the following:

- Understand what an instruction set architecture means and what it details.
- Understand how an assembler converts instructions into machine code.
- Understand how programmers deal with asynchronous programming.
- Understand how virtual systems and dynamic translation is performed.
- Understand how memory is allocated and used.
- Understand how an operating system handles interrupts or exceptions.
- Understand how instructions are executed in the CPU.
- Understand how information is written to or read from memory.
- Understand how cache can improve performance.
- Understand how instruction-level parallelism can improve performance.

Value Proposition

We will be looking at how computers run programs and several ways to improve the performance of a computer. This requires you to import your knowledge from previous courses, including COSC130 and ECE255. Since those were probably a while ago, it is probably best for you to refresh your knowledge on these courses.

LEARNING ENVIRONMENT

We will be using Canvas modules which compartmentalize the assigned readings and assignments for a given week of instruction. Canvas also contains additional syllabus information, including grading weights, and how assignments will be curated.

HOW TO BE SUCCESSFUL IN THIS COURSE

UT's Online Programs department has put together a helpful checklist on Programs How to be Successful in an Online Course (https://volsonline.utk.edu/students/).

Learner Expectations

- Actively check Canvas for due dates and upcoming assignments.
- Read lecture slides BEFORE lecture.
- Actively contribute to the learning activities in class.
- Abide by the UT Honor Code.

- Abide by the policy manual.
- Exercise due diligence when asking questions.
    - Remember, we won't be there when you're doing this for real!
- Actively seek help early! Don't let a section of the course drag the rest of it down for you!

COURSE REQUIREMENTS

Texts/Resources/Materials

There is no required textbook for this course. However, some information might be found in the Computer Architecture: A Quantitative Approach (6th Ed) [ISBN: 978-0128119051] if you need reference material. However, the lecture slides, lectures, and videos should be enough for you to be successful in this course.

Computer Requirements

Students must have a laptop or other computer capable of connecting to Canvas. Furthermore, students must be able to connect to the EECS lab computers, either Hydra or Tesla. Students who encounter issues may contact general campus computing information, (https://newvols.utk.edu/prep/computer-requirements/), or computing support (https://oit.utk.edu/desktops/). For help on the lab machines, please contact EECS IT at https://help.eecs.utk.edu/.

Course Resources

Students unfamiliar with the online environment may find additional information from the resources below:

1. Getting Started with Zoom
2. Online@UT Canvas
3. UT Library

Technical Support

For technical issues, contact the OIT HelpDesk by phone at (865) 974-9900 or at the Walk-in HelpDesk,. For IT and Computing issues, use the online Contact Form.

COURSE COMMUNICATIONS POLICY

Students are required to frequently check Canvas. Students must also make sure that they are receiving announcement notifications so that any pertinent information is received in a timely fashion.

Questions

Students MUST use Piazza to submit all online questions. Any question with assignment information must make sure they submit a private question.

Students must come to office hours with questions already in mind. The room will fill up fast, so students must ask their question and leave. If the student has other questions, they may come back, but we must serve a large student body, so please help us keep the questions flowing so that all students can have their questions answered.

Email

For most purposes, do NOT email the TAs or professor directly. These emails are likely to be ignored. Instead, students must use the Piazza link provided on Canvas for all communications and questions.

COURSE ATTENDANCE AND PARTICIPATION POLICY

Students must participate fully in all course discussions and clicker question to receive full credit for their daily participation grade. Students are expected to have read all lecture material BEFORE coming to class. The lecture improves your understanding of material you have been introduced to and should not introduce new subject material to you.

ASSIGNMENTS, ASSESSMENTS, AND EVALUATIONS

Students will have their assignments graded on Canvas. Students may appeal any grade they receive provided they submit, in writing, their request for a regrade within 7 days of receiving the grade. Students who submit a request outside of 7 days may not appeal their grade, and the grade they receive will stand.

Student Feedback to Inform Course Improvements

Students must complete a periodic survey where they can submit comments and ratings for that week's course content and delivery. Since we are working to improve this course, students are encouraged to be honest and write constructive criticism to help. Please be specific to what we could do better.

Procedures for Turning in Assignments

Students will submit all assignments through Canvas. Students are responsible for ensuring that what they submit is what they wish to be graded. Students are encouraged to download their submission to ensure it is what they expected to submit. Only the latest submission made will count for those assignments that offer multiple submissions or attempts.

Students must check Canvas for due dates. Any assignment after this due date will be graded 0. Students should give themselves plenty of time to work out any connection issues prior to the due date.

Plagiarism

Students are not permitted to work with anyone else for this course. All graded assignments are individual works. Students suspected of plagiarism will be submitted to the Office of Student Conduct for further investigation. Students who are reasonably found to have

plagiarized will receive a 0 for the assignment and a 10-point drop in their grade. Multiple occurrences and cheating on an exam will result in an F for the course.

GRADING CRITERIA

Grading Scale
Students will be graded based on the UT standard grading system.

Grades
All grades and feedback will be provided on Canvas. Students must check Canvas to see their standing in the class.

Students will have several of their lowest grades dropped in each category. Students must refer to Canvas to see which scores of theirs will be dropped.

Disability Services
Any student who feels s/he may need an accommodation based on the impact of a disability should contact Student Disability Services (http://sds.utk.edu) in Dunford Hall, at 865-974-6087, or by video relay at, 865-622-6566, to coordinate reasonable academic accommodations.

Your Role in Improving Teaching and Learning Through Course Assessment
At UT, it is our collective responsibility to improve the state of teaching and learning. During the semester, you may be requested to assess aspects of this course either during class or at the completion of the class. You are encouraged to respond to these various forms of assessment as a means of continuing to improve the quality of the UT learning experience.

You will be asked to participate in surveys after each exam in this course. This course is still being developed to be fully accessible to all students, so please give your honest and constructive feedback on these surveys.

Key Campus Resources for Students
- Center for Career Development (Career counseling and resources; HIRE-A-VOL job search system)
- Course Catalogs (Listing of academic programs, courses, and policies)
- Hilltopics (Campus and academic policies, procedures and standards of conduct)
- OIT HelpDesk (865) 974-9900
- Schedule of Classes/Timetable
- Student Health Center (visit the site for a list of services)
- Student Success Center (Academic support resources)
- Undergraduate Academic Advising (Advising resources, course requirements, and major guides)

- University Libraries (Access to library resources, databases, course reserves, and services)

COURSE SCHEDULE/OUTLINE/ASSIGNMENTS/UNITS OF INSTRUCTION

Students must check Canvas frequently for a list of topics, policies, procedures, and weekly assignments. The Syllabus section of the Canvas page contains a calendar with all due dates and special events.

*Please note: The instructor reserves the right to revise, alter or amend this syllabus as necessary. Students will be notified in writing/email of any such changes.